THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES.

APRIL, 1892.

MENTAL AFFECTIONS AFTER INFLUENZA.

By Julius Althaus, M.D., M.R.C.P. Lond.,
SENIOR PHYSICIAN TO THE HOSPITAL FOR EPILEPSY AND PARALYSIS, REGENT'S PARK, LONDON.

I do not intend to speak in this paper of the delirium which sometimes precedes, and at other times accompanies, the feverish attack of grip, but only of those forms of mental disturbance which occur when the fever has subsided, and after the patient has entered the period of convalescence. With regard to the former, I will only say that both the initial delirium and that which occurs during the attack appear to be of comparatively slight importance, except in those cases where there is a very strong hereditary or acquired neurotic predisposition. In such persons the feverish delirium may be the first symptom of a psychosis which may continue after the original illness has subsided. Where there is no such predisposition the delirium habitually ceases with the fever, without apparently leaving any trace in the nervous system of those who have been affected by it.

Although post-grippal psychoses have probably occurred in previous epidemics, proper attention has only been given to them after those visitations which we have recently passed through. Thus we find hardly anything worthy of note concerning them in the well-known *Annals of Influenza*, by the late Dr. Theophilus Thompson, recently republished by his son, Dr. Symes Thompson,[1] or the works of Schweich,[2] Kusnezow

[1] Influenza, or Epidemic Catarrhal Fever. Being a new and revised edition of "Annals of Influenza," by Theophilus Thompson, M.D. Edited by E. Symes Thompson, M.D. London, 1890.

[2] Schweich: Die Influenza. Berlin, 1836.

and Hermann,[1] and others. Kraepelin,[2] who has written an excellent paper on the influence of acute diseases in the causation of mental affections, published in 1881 and 1882, has entered fully into the different forms of insanity observed after intermittent and rheumatic fever, pneumonia and pleurisy, the acute exanthemata, erysipelas, typhoid fever, and cholera, but has not said a word on psychoses subsequent to influenza. The same observer has, however, more recently[3] written a short but interesting article on some cases which have been under his care after the epidemic of 1889 to 1890; while we have further contributions to the same subject by Becker,[4] Pick,[5] Rosenbach,[6] Joffroy,[7] Pons,[8] Bartels,[9] Schmitz,[10] Kirn,[11] Drasche,[12] Van Deventer,[13] Metz,[14] Brakenridge,[15] Snell,[16] Ladame,[17] Mispelbaum,[18] Bidon,[19] Mairet,[20] Leledy,[21] Savage,[22] and others.

I will now shortly relate some cases of this kind which have been under my care, and then discuss the pathogenesis, prognosis, and treatment of these affections.

[1] Kusnezow und Hermann: Influenza. Eine geschichtliche und klinische Studie. Wien, 1890.

[2] Kraepelin: "Ueber den Einfluss akuter Krankheiten auf die Entstehung von Geisteskrankheiten," Archiv für Psychiatrie, vol. xi. pp. 137, 295, and 649; vol. xii. p. 287. Berlin, 1881, 1882.

[3] Ibid.: "Ueber Psychosen nach Influenza," Deutsche med. Wochenschrift, 1890, No. 11.

[4] Becker: "Geisteskrankheit nach Influenza," Neurolog. Centralblatt, 1890, No. 6.

[5] Pick: "Geisteskrankheit nach Influenza," Neurol. Centralblatt, 1890, No. 4.

[6] Rosenbach: "Einige Bemerkungen über Influenza," Berliner klin. Wochenschr., 1890, No. 5.

[7] Joffroy: "Délire avec Agitation maniaque dans l'Influenza," Mercredi Médical, No. 13, 1890.

[8] Pons: "La Grippe chez les Aliénés," Journ. de Med. de Bordeaux, 22 Févr., 1890.

[9] Bartels: "Einfluss der Influenza auf Geisteskrankheiten," Neurol. Centralblatt, No. 6, 1890.

[10] Schmitz: "Influenza und Geisteskrankheiten," Allg. Zeitschrift für Psychiatrie. Berlin, 1890, p. 238.

[11] Kirn: Die nervösen und psychischen Störungen der Influenza Leipzig, 1891.

[12] Drasche: "Ueber Influenza," Wiener med. Wochenschr., 1890, Nos. 6, 17, 19, 21.

[13] Van Deventer: "Ueber Influenza verbunden mit Geisteskrankheiten," Centralbl. für Nervenheilkunde, Mai, 1890.

[14] Metz: "Heilung einer Paranoia nach Influenza," Neurolog. Centralblatt, 1890, No. 7.

[15] Brakenridge: "The Present Epidemic of So-called Influenza," Edin. Med. Journ., May, 1890.

[16] Snell: "Influenza," Allg. Zeitschrift für Psychiatrie, Berlin, 1890, p. 418.

[17] Ladame: "Des Psychoses après l'Influenza," Annales medico-psychol., Paris, 1890, p. 20.

[18] Mispelbaum: "Ueber Psychosen nach Influenza," Allg. Zeit. f. Psych., 1890, p. 727.

[19] Bidon: "Etude clinique sur l'Action de la Grippe sur le Système nerveux," Revue de Médecine, Paris, May and November, 1891.

[20] Mairet: "Grippe et l'Aliénation mentale," Montpelier Medical, Mai et Juin, 1890.

[21] Leledy: La Grippe et l'Aliénation mentale. Paris, 1891.

[22] Savage: "The Neuroses of Influenza," The Lancet, Nov. 9, 1891.

CASE I. *Neurasthenia and hypochondriasis.*—A single woman, aged thirty-five years, had influenza in March, 1890. Until then she had enjoyed excellent health, and her family history was unimportant. I first saw her in May of the same year, when she complained that ever since her attack she had been unable to attend to her occupation, which was that of a housekeeper. She had lost all confidence and nervous power, cried for no cause, could not sleep, or if she did so, was troubled with distressing dreams, from which she awoke in a state of terror. She had lost her appetite, suffered from a most wearying feeling of pressure on the top of the head, and was constantly in a state of the greatest despondency. On attempting to do anything she had a sensation as if her brain were moving about in her head, together with such throbbing as to excite the apprehension of an impending fit. Indeed, she felt sure that she had an incurable brain disease.

Percussion of the cranium sent a strong thrill through her body. The knee-jerk and other reflexes were much exaggerated. The fundus oculi was normal, the pulse feeble and irregular, 108; the tongue furred, the temperature subnormal, the urine had a density of 1004 and was very feebly acid. I prescribed sulphonal at bedtime, an aconite liniment to the head, hydrobromate of quinine with strychnine three times daily, and a much more nourishing and digestible diet than the patient had hitherto had. She was much improved in a fortnight, and in about three months was well enough to resume her occupation.

CASE II. *Melancholia.*—A young lady, aged nineteen years, was brought to me in April, 1890, by her mother, who informed me that ever since the girl had had influenza, six weeks ago, an extraordinary change in her temper had taken place. While formerly she had been of a cheerful and energetic disposition, and interested in a great variety of things, she had now become sullen in her behavior, and disinclined for work or conversation. When requested to do anything, she either took no notice or said she could not do it; she sat generally in a chair all day long, staring before her. She refused to go out, to eat, and would sometimes sit up all night. She often said that she was lost and could not be saved. Her previous history was good, as she had never ailed anything except measles and whooping-cough, and the family antecedents were also satisfactory. Both parents were alive and well, and there were six other children all in good health. The catamenia of the patient had appeared when she was fourteen years of age, and had ever since been regular and unattended with discomfort.

The patient had a dogged expression, answered questions not at all or in a perfunctory manner, and appeared to have a difficulty in articulating. The fundus of the eye was normal, the knee-jerk exaggerated, and the muscular power feeble, the dynamometer showing only 35° on the right and 20° on the left side. The tongue was furred, the temperature subnormal, and the pulse of low tension and beating at 128. The urine had a density of 1005, was neutral, and contained an excess of phosphates. The bowels were extremely sluggish, acting only every four or five days. I prescribed digitalis, quinine, phosphide of zinc, and aperients, and advised removal of the patient into different surroundings. For about a month after my first interview with her, she remained in very much the same condition; an improvement then became manifest, and in four months after the first appearance of the symptoms she had quite recovered.

CASE III. *Delirium of inanition.*—A clerk in an accountant's office, aged twenty-six years, single, was brought to me by his father in May, 1891. I was informed that the patient had always been quite well and strong, had never had a day's illness, was steady in his habits and a hard-working, clever man, who had gained the confidence of his employers. He had never had syphilis.

In April last he had a severe attack of influenza, which confined him to his bed for a week. He insisted, however, on getting up and going to the office before his doctor had allowed him to do so, being over-anxious to resume his occupation. His employers, noticing that he seemed very feeble and ill, wished him to go to the country to recruit his strength, but the patient said he was quite well enough to work. His fellow-clerks, however, noticed at once that he was quite a different man; he dawdled over his work, did not seem to understand what he was about, spoke in a foolish manner and made mistakes in letters and accounts. It was noticed that his bedroom, which he formerly used to keep very tidy, was in a fearful state of disorder, all his things being thrown pell-mell about the floor. When walking in the streets, he swayed about and behaved so strangely that he was several times on the point of being given into the charge of the police. He ate practically nothing all this time, and could not sleep. The next day he appeared to be worse; seemed to have lost his memory altogether; accused his fellow-clerks of robbing their employers; said that there were too many cats and dogs about the place, and expressed a fear that he was going to be prosecuted for perjury. The night after, he got out of bed about 2 A.M. and ran for the office, where he created a great disturbance, calling for the police, and shouting that there were thieves in the place. He was brought to me about 10 A.M. the same day, as his people did not know what to do with him. The patient gave a most confused account of what had happened to him during the last few days, was very excited and asked his father repeatedly not to speak so loud, as he did not wish people to know that he was in my house. There was utter incoherence of ideas. When asked to write his name and address and the date of the month, he made several glaring mistakes. During the interview with me he was constantly getting up, walking about the room and sitting down again. His tongue was furred, his breath had a peculiarly offensive odor, the pulse was 140 and extremely feeble, the temperature subnormal, and he nearly fainted away twice during the interview.

I gave him at once a hypodermatic injection of morphine, and prescribed sulphonal at bedtime, ammonium bromide, with digitalis and nux vomica three times a day, and a highly nourishing and easily digestible diet, with four ounces of brandy in the twenty-four hours. Three days afterward the patient had improved so much that he was fit to be taken to the country, where he remained for three months. He made a gradual and satisfactory recovery, and when I saw him last, in October, 1891, he had been quite well, and had regularly attended to his work during the last six weeks.

CASE IV. *Homicidal impulses.*—A broker, aged thirty-three years, married and father of five children, first consulted me in 1880 about hypochondriacal feelings from which he suffered. Under the influence of treatment he improved, and remained fairly well until four years afterward, when he had a more severe attack of melancholia, apparently without any particular cause. After about twelve months, however, the pa-

tient's mind gradually brightened up, he again began to take an interest in life, and resumed business with considerable vigor. He now remained quite free from any mental trouble until December, 1889, when he had a bad attack of grip, with high fever, severe headache and persistent insomnia. He came to see me in February, 1890, and had hardly entered my room when he burst out crying, and said that he was in a dreadful condition, as he constantly felt an almost irresistible impulse to kill his wife and children, and kept praying all day and night that he might not do so. He was often obliged to rush out of the room at meal times, because the sight of knives on the table made him feel as if he were compelled to cut his wife's and children's throats. He was unable to attend to his business, suffered from giddiness and loss of sleep, and had great pain and tenderness in the cranium and the upper portion of the spine. The pulse was feeble, 112, and the temperature 99.8°. There was no appetite, and the bowels were confined; the urine was neutral, 1008, and contained an excess of phosphates. As the patient had on former occasions derived marked benefit from the use of electricity, I gave him at once an application of the constant current to the head, two milliampères for the pre-frontal lobes, five minutes, and one milliampère to cervical sympathetic and bulb, one minute each side. He felt greatly relieved and soothed by this application, and I therefore repeated it on the three following days. I also prescribed strychnine, with bromide of ammonium, and an alterative pill at bedtime. Under the influence of this treatment the patient rapidly recovered his mental balance, and appeared to be quite well again about six weeks afterward. I heard from him a short time ago to the effect that his health had since that time been satisfactory.

Case V. *General paralysis of the insane; fatal issue.*—In October, 1891, I saw, in consultation with Dr. Brookfield, of Kilburn, a merchant, aged fifty-two years, married, and father of three children, who had been perfectly well until January, 1890, when he had an attack of grip. He recovered well from this, and did not seem to suffer in any way from the effects of it. In April, 1891, he had a second attack, with which he was laid up for three weeks. When he got up again, it was noticed that a great change had taken place in his general condition. He had lost all interest in his business, was indifferent to his family, was disinclined to talk, and only wanted to be left alone. He likewise showed difficulty in walking, standing, and the use of his hands. He often seemed to be quite absent and silly. In August last he had an attack of left hemiplegia, and, after that, he deteriorated still more rapidly. When I saw him he had for many days been in a state of coma, from which he rallied occasionally, soon to relapse again into it. He was then quite paralyzed, unable to move a limb or even to put out his tongue, and had neurolytic bronchitis, with râles all over the chest, sixty-four inspirations, a pulse of 134, and a temperature of 103.5°. He was, in effect, in *articulo mortis*, and died a few hours after my visit.

Case VI. *Incipient general paralysis of the insane; recovery.*—In October last I saw, in consultation with Dr. Montagu Miller, a merchant, aged fifty-one years, married, and father of three children, who had been in good health until he had influenza in April, 1891. He had never had syphilis, and always lived temperately. He had no catarrh with the grip, but simply nervous symptoms. Ever since then he had

not been the same man that he was before, as he had lapses of memory, worried over trifling matters of business which had formerly left him quite unconcerned, and took undue trouble with things that did not require his attention. He had recently had some domestic trouble, to which, however, he did not appear to attach much importance. About ten days ago he was suddenly taken with epileptiform seizures, affecting one side of the body, and accompanied with short losses of consciousness. He seemed confused, slept either very heavily or not at all, and had lost power in the arms and legs.

During my interview with him he was highly emotional, being several times unable to restrain his tears. His memory was much affected, as he had a difficulty in telling me his age. His manner was altogether peculiar. Cranial percussion did not show any localized tenderness, but he complained of headache, and peculiarly heavy feelings in his head. He told me that when he had attempted to attend to business, he became so excited and confused that he was unable to go on with it. He had great difficulty in composing letters, which were written in a curiously roundabout and unbusiness-like style. The discs were normal. There was awkwardness in the use of his fingers, but the muscular force, as measured by the dynamometer, was fairly good—110° left, and 140° right hand. What attracted particular attention, however, was a curiously shuffling gait, which had only been noticed during the last few days, and which was exactly like that seen in some forms of general paralysis. He had great difficulty in raising his feet from the ground, and walked by pushing one foot after another along the floor. The knee-jerk was exaggerated on both sides; and eliciting it in the ordinary manner, and without any undue force, sent such a thrill through the whole body that the patient very nearly fainted away, and had to be laid flat on a couch. He said that it resounded all through his head, and he trembled all over, more especially with his right hand, for about five minutes.

I advised perfect rest, change of scene, and mercury, with large doses of iodide of potassium. Under the influence of this treatment, the patient improved wonderfully, and when I saw him again about a month afterward, most of the symptoms above related had disappeared. Eliciting the knee-jerk, however, still caused a startling effect; the patient felt "queer" all over, had a sort of spasm in his throat, and shook like a leaf; and this effect lasted nearly three days. Since then he has made such good progress as to enable him to resume his business.

The cases which I have just related may naturally be grouped into four separate classes, viz.: First, neurasthenia, hypochondriasis, and melancholia; second, acute asthenic delirium, delirium of collapse, or as I prefer to call it, delirium of inanition; third, mental affections, grafted upon preëxisting neuroses; and fourth, general paralysis of the insane. Kraepelin,[1] Ladame,[2] and others have distinguished only three different groups, much on the same lines as the three first mentioned, but the cases of general paralysis which I have related do not fit into

[1] Kraepelin: "Ueber Psychosen nach Influenza," Deutsche med. Wochenschrift, 1890, No. 11.

[2] Ladame: "Des Psychoses après l'Influenza," Annales medico-psychol, Paris, 1890, p. 20.

any of their categories, and require an extension of the classification hitherto proposed.

Class 1. The first and apparently most frequent class is that of which Cases I. and II. are instances, and may be characterized as simple mental depression, ranging from ordinary neurasthenia to the more severe forms of hypochondriasis, melancholia, and depressive insanity. The patient is incapacitated from attending to his ordinary occupations, and falls into a gloomy habit of thought, in which dark foreboding of some impending disaster, the apprehension of an incurable disease, which is about to carry him off, or the delusion that he has committed some fearful crime, for which he is going to be imprisoned, tried, and executed, play a leading part. He considers himself disgraced or financially ruined, contemplates suicide as the only escape from his imaginary troubles, and complains that his persecutors do not leave him in peace for a single instant.

To the cases which I have myself described I will now add a few more from the practice of other observers:

Leledy[1] relates the case of a coachman, aged thirty-five years, who had no hereditary predisposition, but was of a somewhat morose and petulant temper. He was not addicted to drink, and his mind had been unaffected before an attack of grip, which was of a mild character. During convalescence he was unable to sleep, and thought that everyone was against him; he expressed great fear of death, more especially when night came on; he then insisted that the whole family should come to his bedside, and made a sort of confession to them. He threatened those persons who endeavored to prevent him from doing foolish things, drank his own urine, and deplored the loss of power from which he suffered. In about three weeks the insomnia left him, and he then began to improve. He presently resumed his occupation, and eventually got quite well.

Another instructive case of this kind is reported by Ladame:[2]

A lady, aged forty-four years, who had a neurotic history, had grip at the end of December, 1889. The feverish attack was moderate, lasting hardly two days, but when it was over there was anorexia, insomnia, and languor. Soon afterward symptoms of melancholia were noticed. She took no interest in her surroundings, seemed to have lost all affection for her husband and only son, said that she was lost, refused food, and would not get out of bed, saying that she was too weak. She lost flesh, and sent for her solicitor in order to make her will. This condition, with some variations for better and worse, lasted about two months. The patient then left her bed, began to eat with a good appetite, and improved rapidly.

Mairet[3] has given the case of a woman, aged thirty-eight years, in whom the most careful inquiry about her past life, as well as the health of her relations, did not yield the slightest evidence that she or they had ever had any neurotic symptom or predisposition. She had an attack of grip in January, 1890, which was not very severe, and from which she had nearly recovered when, on the seventh or eighth day of the disease, her mind became affected.

[1] Leledy: La Grippe et l'Aliénation mentale. Paris, 1891.

[2] Ladame: "Des Psychoses après l'Influenza," Annales medico-psychol., Paris, 1890, p. 20.

[3] Mairet: "Grippe et Aliénation mentale," Montpelier Medical, Mai et Juin, 1890.

There was a quiet kind of delirium, without excitement, and with melancholy ideas. Her family was ruined, they would have nothing to live upon, and were lost. A few days afterward excitement set in, and ten days after the beginning of the delirium she had an apoplectiform attack with loss of consciousness. When she came to, however, there was no paralysis, except a slight deviation of the mouth. In the meantime the melancholia continued; the patient accused herself of being the cause of all the deaths which had taken place from influenza in her parish. She complained that her husband was putting lucifer matches into her drink in order to poison her; she was going to be put into prison; she saw nothing but spiders about the place; at other times she was surrounded by water and wanted to drown herself; or all objects and persons near her appeared to be turned topsy-turvy. She was now admitted into the asylum, where she did not get better; on the contrary, the sensorial perversion became more marked. She was quite dazed, and did not know where she was or what year it was, etc.

Snell[1] mentions the case of a girl, aged eighteen years, in whom melancholia developed almost directly after the attack of grip was over. She was going to be admitted into an asylum, when she committed suicide by hanging herself.

Martin, quoted by Ladame,[2] has described the case of a coffee-house keeper, aged forty-five years, of temperate and regulate habits, happy at home, and in easy circumstances, who was in good health when he had an attack of grip, of medium intensity, which lasted three days. He did not feel well afterward, but refused to see a doctor, was sad and melancholy, and complained of great lassitude. He several times spoke of being tired of life, and about a fortnight after the attack was over, cut his throat with a pocket-knife, severing the windpipe and the carotid.

In this case there was hereditary predisposition, as a brother of the patient had previously committed suicide.

Psychoses of the same character as those described are apt to occur after other infectious diseases of somewhat longer duration, more particularly after typhoid and rheumatic fever, and whooping-cough.

Class 2. The second group of post-grippal psychoses, of which Case III. is a representative, is characterized by excitement rather than by depression. The symptoms are apt to occur either immediately after a crisis, when there has been a sudden considerable fall of temperature, and profuse perspiration, or within a week or two after the fever has subsided, during which time the patient has generally suffered from insomnia, prostration, and loss of appetite. There is confusion of ideas, delirium which may be of a maniacal character, and an abundant crop of delusions. The delirium habitually lasts from a few days to a fortnight, after which the patient either recovers, or gets into a condition of melancholia, or even dementia, which may continue from a few weeks to several months. These cases are therefore analogous to those which Hermann Weber[3] has so ably described as those of acute insanity, or

[1] Snell: "Influenza," Allg. Zeitschrift für Psychiatrie, Berlin, 1890, p. 418.

[2] Ladame: "Des Psychoses après l'Influenza," Annales medico-psychol., Paris, 1890, p. 20.

[3] Hermann Weber: "On Delirium or Acute Insanity during the Decline of Acute Diseases, especially the Delirium of Collapse," Med.-Chir. Soc. Trans., London, 1865, vol. xlviii, p. 135.

delirium of collapse, and which are seen chiefly after infectious fevers of short duration, such as pneumonia, measles, scarlet fever, smallpox, and the puerperal state. There are several forms of them, characterized by rapid deterioration of the mental faculties, or primary dementia, or confusion with hallucinations, etc. The condition is always, however, owing to sudden exhaustion of brain power from excessive destruction of the unoxidized albumin of the cerebral tissue, and for this reason I consider the term "delirium of inanition" to be the most appropriate. The inanition is, indeed, sometimes so great as to lead to a fatal issue, the patients dying with the symptoms of sudden cardiac failure and collapse.

Mairet[1] has given the case of a gentleman, aged fifty years, who had never shown any trace of neurotic predisposition throughout his previous life, but whose mother had had softening of the brain and dementia when she was fifty years of age. This patient had a slight attack of grip in January, 1890, without much fever or localized symptoms; he was, however, twelve days in bed, after which the fever was gone, and only some anorexia remained. Five days afterward, his doctor allowed him to go out, but he soon returned home, complained of a severe headache, and had almost immediately afterward an attack of violent delirium, with hallucinations and excitement. He exclaimed that he had ruined himself and his family; he saw people behind his bed-curtains, who threatened to murder him; and in order to escape from them he attempted to jump out of the window. He struggled with his attendants, and had no sleep at all. He was confused, the speech was thick, and there was paresis of the bladder. The prognosis appeared, therefore, somewhat grave; but after eight or ten days the delirium subsided, the apparent state of dementia and the paresis of the bladder disappeared, and about three weeks after the beginning of the affection, the patient was quite well again.

A somewhat analogous case has been related by Schmitz.[2] The patient was a shoemaker, aged twenty-four years, in whose family there was no history whatever of mental or nervous diseases. He had always been in good health himself, except that in consequence of an accident, when sixteen years of age, his left foot had to be amputated, and that he occasionally felt pain in the stump. In January, 1890, all the inhabitants of the house in which he lived had influenza. He had it himself slightly, complaining chiefly of headache, loss of appetite, and insomnia; but there was little or no fever or prostration. Five days afterward he commenced having visual and auditory hallucinations. He complained that there were two men and a woman standing at the window, who wanted to drown him. He could not sleep, was constantly jumping out of bed, bolted all the doors, and listened intently, sometimes in one place, and sometimes in another. Next morning he seemed better, but became again more restless toward evening. He went to a friend to borrow a pitchfork, after which he was locked in a room; he then jumped out of the window, and stuck the pitchfork repeatedly into the street-door, saying that he wanted to stab the wretches. On another occasion he took up a bread-knife and ran along the street, looking for his persecutors, telling a boy whom he met to take himself off, as otherwise he would be dead to-morrow. The whole neighborhood eventually became alarmed, and he was sent to an asylum; he soon recovered there, and was well enough to be discharged at the end of February.

[1] Mairet: "Grippe et Aliénation mentale," Montpelier Medical, Mai et Juin, 1890.

[2] Schmitz: "Influenza und Geisteskrankheiten," Allg. Zeitschrift für Psychiatrie, Berlin, 1890, p. 238.

Leledy[1] has seen the case of a priest, aged forty-six years, without any hereditary stain, who was generally in fair health, but habitually suffered from impaired digestion. He had influenza with rather severe bronchitis, insomnia, and loss of appetite. On the fifteenth day he began to be excited, and had grand delusions. He had been made a cardinal, and then pope. He soon became violent, caressed the sisters who nursed him, and afterward kicked them, boxed their ears, spat into their faces, and threatened to kill them.

The agitation increased as time went on, and he eventually escaped from his room, ran, only half-dressed, into church, where another priest was celebrating, mounted the pulpit and shouted to the congregation that the celebrant was not doing the work properly, called upon them to receive his own blessing, and then threw chairs and benches at their heads. He also gave expression to erotic feelings, and made indecent proposals to the sisters who nursed him. When he was taken to the asylum, he smashed the windows of the carriage, shouted, screamed, foamed at the mouth, threatened the people with excommunication, said that he was the representative of heaven on earth, and endeavored to kiss and bite alternately. This delirium continued for four days more; the patient then became calmer, and a month after the beginning of the mental affection he was well enough to be discharged and to go to the country to recuperate.

The result is, however, not always so satisfactory as it was in the foregoing cases.

Thus, Mispelbaum,[2] has seen a youth aged sixteen years, whose mother had been, when she was quite young, for three months in an asylum, but who had since then been quite well. He had an attack of grip at the end of December, 1889; was in bed for two days, then got up, and felt, about a week afterward, well enough to resume his occupation as a mason's apprentice. Five days after he had gone back to work, however, the first symptoms of mental confusion occurred. He thought another lad was lying in his bed; he did not recognize his friends, or called them by wrong names; could not swallow, did not call for food, lay in bed with his eyes closed, and passed the excreta under him. He appeared terrified, cried and sobbed, and said he had perjured himself. He also had hallucinations of vision, vertigo, and vomiting. He gradually improved, but was not well toward the end of March, and his faculties seemed to have suffered to such an extent that chronic dementia was feared.

Bartels[3] has met with a case which shows that the delirium of inanition may also ensue after influenza in those previously insane. His patient was an old lunatic, who had been habitually full of stationary delusions. After an attack of influenza, however, he got into a state of the utmost anxiety and confusion, which appeared to be caused by hallucinations, became prostrate, and died. The autopsy showed chronic pachymeningitis and leptomeningitis.

Class 3. The third group of post-grippal psychoses includes those cases in which grip forms, as it were, only the accidental exciting cause of a mental affection in persons who are strongly predisposed to the latter, or have already suffered from previous attacks of insanity or allied neuroses. In such persons the psychosis does not assume the clinical features of those mental affections which are particularly apt to occur after other infectious diseases. Thus, there may be a sudden attack of delirium

[1] Leledy: La Grippe et l'Aliénation mentale, Paris, 1891.

[2] Mispelbaum: "Ueber Psychosen nach Influenza," Allg. Zeit. f. Psych., 1890, p. 127.

[3] Bartels: "Einfluss der Influenza auf Geisteskrankheiten," Neurol. Centralbl, 1890, No. 6.

tremens in an alcoholized person, or acute mania in one who has previously had it, etc. The attack of influenza, therefore, only forms, as it were, the last link in a chain of events tending to cause mental disturbance which might also have broken out in consequence of any other exciting cause, or indeed without any such cause at all. Indeed, the attack of grip in such cases appears to be the last straw that breaks the camel's back. The character of these psychoses is, therefore, not so much determined by the special infectious disease as by the individual peculiarity of the patient, and may for this reason assume the most varied characters.

Case IV., which is a representative of this class, was one in which homicidal impulses appeared after grip.

Maunoir, quoted by Ladame,[1] mentions the case of a medical student, aged twenty-six years, who had previously suffered from depression and other symptoms of mental disturbance, and after an attack of influenza, developed a suicidal tendency. He told his friends that he preferred dividing the carotids to any other form of suicide. The day before his death he spent the evening with his friends, was very animated in conversation, and borrowed books from them. The following morning he cut his throat.

The newspapers of the time[2] reported the case of a young man, aged twenty-two years, who had generally behaved quite properly, but was of a taciturn disposition, and probably hereditarily predisposed. He had influenza badly, and his sister had just died of the same complaint. Apparently under the influence of these exciting causes, he suddenly killed his mother, with whom he had been talking quietly only a minute before, with a single blow of a hatchet. He then took the hatchet back to the place from where he had taken it, and when the neighbors, attracted by the noise, rushed into the room, he walked about quite unconcernedly, as if nothing had happened. He was taken in charge, but did not seem to realize the situation.

Leledy[3] mentions the case of a woman aged thirty-five years, whose father was an habitual drunkard and had been insane; the mother had died of heart disease. She often suffered from headaches, and had very pronounced religious views. When her father died she expected to receive a considerable sum of money, but it turned out that the will had been made in favor of her brother. She was very much annoyed at this, and a change in her manner was noticed; she became morose, was apt to cry, and wanted to be left alone. She had grip in January, 1890, of a mild type, and got apparently well over it. Soon afterward, however, she became excited and incoherent, left her home and wandered about the country. Violence and grand delusions soon became developed. When admitted into the asylum, she boxed her husband's ears, shouted that she had been robbed of her money and of her patent of nobility; she was a countess, and wanted her dresses and jewels back. She struck the sisters, servants, and other patients, and endeavored to bite, tore up her clothes, and had no sleep. From time to time there was a period of relative calm, which, however, did not last. She soon became so violent again that she had to be isolated; even in the intervals of quiet she continued incoherent, unduly talkative, and full of delusions.

Kraepelin[4] has described the case of a farmer's son, aged twenty years,

[1] Ladame: "Des Psychoses après l'Influenza," Annales medico-psychol. Paris, 1890, p. 20.

[2] Deutsche Reichszeitung, Jan. 29, 1890.

[3] Leledy: La Grippe et l'Aliénation mentale. Paris, 1891.

[4] Kraepelin: "Ueber Psychosen nach Influenza," Deutsche med. Wochenschrift, 1890, No. 11.

whose brother was subject to stammering and who had two cousins who were insane. He had for years past suffered from a form of spasmodic torticollis; and expressed odd ideas about his being called upon to restore peace in his family. He was laid up with influenza for a week and then resumed work, but had a relapse, when he began to chatter away all day long; was very restless, irritable, conceited, read aloud from the Bible, and made speeches. After a time, however, he quieted down and resumed work.

The same observer has in another case seen a sudden development of paralysis, with aphasia and impaired memory, hypochondriacal and grand delusions, which had until then been latent (?), and a young epileptic in whom heavy lethargy came on after influenza.

Snell[1] mentions the case of a factory girl aged seventeen years, who had been admitted into the asylum of Hildesheim for melancholia. The latter condition was after a time followed by a state of merry excitement; but eventually the girl quieted down, was convalescent and fit for discharge, when she was seized with influenza, from which she made an apparently good recovery. About a month afterward, however, malaise with vomiting set in, and was followed by a most severe form of mania. The state of this patient was greatly aggravated by the intercurrent attack of grip.

Class 4. The fourth and last class of post-grippal psychoses consists of cases of general paralysis of the insane, where no doubt can exist that grave degenerative lesions of the cortex and the cerebral membranes are present. I much regret that I could not obtain a post-mortem examination in Case V., in which coarse lesions similar to those habitually found in general paralysis would unquestionably have been discovered. That case was remarkable by the exceedingly rapid development of grave symptoms, pointing to organic brain disease, and ran an unusually quick course, carrying the patient off in less than six months, while where general paralysis is owing to syphilis and other causes, the duration of the disease is habitually at least two years, and often very much longer. The grippo-toxine is therefore shown to be in certain cases a poison of greater virulence than the syphilitic toxine.

I confess that I do not understand what Kraepelin means by saying (*loc. cit.*) that there had been in one of his cases a sudden development of paralysis with impaired language and hypochondriacal and grand delusions, which had been *latent* until influenza brought them out. I have never seen latent paralysis and aphasia, and I suspect that the case alluded to was similar to my cases of general paralysis (V. and VI.).

The successful result in Case VI. shows that energetic treatment may be followed by recovery even where structural disease has already commenced.

PATHOGENESIS.—Let us now inquire how these post-grippal psychoses, the clinical features of which I have just described, originate.

I will consider—first, the influence of the fever; second, that of the grippo-toxine; and third, the individual susceptibility of the patient.

1. *The fever.* That a rise in the temperature of the blood must have an important influence on the nutrition, and consequently on the func-

[1] Snell: "Influenza," Allg. Zeitschrift für Psychiatrie. Berlin, 1890, p. 418.

tions of the brain-cells, appears self-evident. Increased heat constitutes an irritant for all nerve-tissues. A frog's leg which is artificially heated by a few degrees, is at first irritated, so that slight stimuli cause excessive responses, and afterward paralyzed, when stimulation has no longer any influence at all.

Clinically, the same effect is seen in heat-stroke and the hyperpyrexia of rheumatic fever, and also in such infectious fevers as pneumonia, intermittent fever, and the acute exanthemata, where the nerve-centres experience a more or less sudden elevation of temperature, amounting perhaps to 4° or 5°. The consequence of this is increased oxidation of the uncombined albumin of the brain; and such a chemical change must, of itself, lead to irritation, followed by depression.

There is as yet very little accurate information about the more intimate changes caused in the metabolism of the brain and the body by the fever-heat; and the most recent researches of Loewy[1] have thrown no further light on this point, except than to make it clear that the destruction of albumin is invariably increased in fever, while the destruction of fat is rather diminished, except in cases where accidental agencies are active, more especially increased muscular action, when the oxidation of fat may also be more or less augmented. Anyhow, it is evident that, when the supply of unoxidized albumin in the brain is exhausted, the mental faculties must become impaired.

A factor which has to be considered in addition to the fever-heat is the acceleration of the heart's action, which coexists with the beginning and acme of the fever, and which causes of itself an active hyperæmia of the brain. A mechanical agency is thus added to the chemical one. An unduly large amount of overheated blood is supplied to the brain within a given period, thus increasing the irritation. That there is really active hyperæmia of the brain during fever is shown by the clinical symptoms of fulness in the head, excitement, restlessness, insomnia, undue sensitiveness to light and sounds, by the examination of the fundus of the eye, and the beneficial results of a depleting treatment. After a time, however, there is a failure of the heart's power, with or without a fall of temperature; and the necessary consequence of this is passive congestion in the cerebral and meningeal veins, which, in its turn, leads to anæmia and impaired nutrition of the cerebral substance, and in severe cases to œdema of the brain.

The clinical symptoms corresponding to this condition are light headedness, a dazed state, which may be followed by maniacal excitement and violent delirium, and may end in coma and death.

2. *Grippo-toxine.* While, therefore, the fever-heat and the unduly

[1] Loewy: "Stoffwechsel-untersuchungen im Fieber," etc., Virchow's Archiv, Berlin, 1891, vol. cxxvi, p. 218.

violent cardiac action undoubtedly tend to cause impaired nutrition of the brain substance, there is another factor which, in my opinion, has an infinitely more powerful influence in that direction, and that is the presence in the blood of the grippo-toxine. That this poison affects the brain injuriously of itself is shown by the circumstance that in grip, as well as in some other infectious fevers—such as smallpox, typhoid, intermittent and scarlet fevers—delirium may be the first symptom of the illness, before the temperature of the blood has risen, or the heart's action has become accelerated.

An interesting case of this kind has been recorded by Ewald:[1]

A boy,[2] aged seven years, appeared to be in his usual health when one morning, instead of going to school, he went to a railway station, and took a seat in a carriage, saying that he intended to go to Leipzig, where his father lived. He was removed from the train, but appeared to have forgotten his name and address. He was eventually taken home and appeared then quite wild. Fever and other signs of influenza presently supervened, and the boy continued delirious for several days. A crisis then occurred, and he recovered his mental balance.

Joffroy[3] has described the case of a man, in whom grip commenced with violent delirium, in which the patient did not recognize his friends, sang and shouted, and was apprehensive of being murdered. Symptoms of grip after a time became developed, and the delirium continued for seventeen days longer. The patient then regained consciousness, and eventually made a good recovery.

That the fever has much less to do with the production of post-grippal psychoses than the special toxine of the malady is also shown by the circumstance that it is generally short, and in many cases insignificant. The temperature often does not exceed 101° or 102°, and continues at this rate only for a day or two, so that the case would almost appear like one of simple febricula; yet the prostration of mental and bodily strength which follows is so profound as to be quite inexplicable except on the assumption of deterioration of the nerve-centres by the grippo-toxine. Indeed, the degree of fever bears often no relation whatever to the gravity of the mental affections following in its wake. We see in this an analogy with syphilis, where the primary symptoms may be so slight that they attract very little attention, and yet are followed by severe secondary and tertiary manifestations. The deleterious effects of grippo-toxine do not cease with the fever, and I contend that *this virus is the principal agent in the causation of the psychoses which are apt to occur after grip.*

3. *Individual predisposition.* I have now to discuss one of the most

[1] Ewald: "Ueber Influenza," Deutsche med. Wochenschr., Jan. 23, 1890.

[2] This boy has been curiously enough changed into a girl by Leledy (loc. cit., p. 90), who speaks of him as "une petite fille," and employs the terms "elle" and "la" throughout the relation of the case.

[3] Joffroy: "Délire avec Agitation maniaque dans l'Influenza," Mercredi Médical, 1890, No. 13.

difficult points in the pathogenesis of post-grippal psychoses, and regret to find myself here at issue with almost all authors who have written on this subject. Up to the present time it has been generally assumed that grip alone is not sufficient to cause any psychoses, and that it is necessary for the production of these latter that there should be an hereditary or acquired neurotic predisposition in those who are affected by these troubles. Kraepelin[1] lays this down as an axiom in the most unequivocal terms. He states plainly that in the production of post-grippal psychoses there are invariably other active causes at work besides the influenza, and that the latter alone is insufficient to cause acute insanity in a normally constituted person. In his opinion the influence of grip is altogether a factor of little importance, while predisposition or other noxious agents—such as anæmia, chronic lung disease, gastric catarrh, cardiac affections, the puerperal state, and finally depressing emotions occurring after the feverish attack—must be held responsible for the outbreak of insanity in the cases in question.

Ladame[2] absolutely agrees with Kraepelin on this point, and states that individual predisposition, hereditary or acquired, plays the principal part in these affections. He says: "On trouve toujours des causes prédisposantes à la folie qui suit l'influenza" (*loc. cit.*, p. 30), and "l'influenza à elle seule ne suffit jamais à provoquer la folie" (*loc. cit.*, p. 40). Again, Leledy[3] states that "le rôle joué par la grippe peut être variable. Tantôt cause occasionelle, elle peut être ailleurs cause déterminante, adjuvante. La s'arrête le rôle étiologique de la grippe qui ne saurait être regardée comme cause essentielle, cause pathogène. Il existe toujours une prédisposition innée ou acquisé." The same opinion is expressed by Van Deventer,[4] Bidon,[5] and all other authors with whose writings I am acquainted.[6]

As for myself, I am utterly opposed to the theory which assigns the determining part in the causation of post-grippal psychoses to a neurotic predisposition of those in whom they have become developed; and I

[1] Kraepelin: "Uber Psychosen nach Influenza," Deutsche med. Wochenschrift, 1890, No. 11.

[2] Ladame: "Des Psychoses après l'Influenza," Annales medico-psychol., Paris, 1890, p. 20.

[3] Leledy: La Grippe et l'Aliénation mentale. Paris, 1891.

[4] Van Deventer: "Ueber Influenza verbunden mit Geisteskrankheiten," Centralbl. für Nervenheilk., Mai, 1890.

[5] Bidon: "Etude clinique sur l'Action de la Grippe sur le Système nerveux," Revue de Médecine, Paris, May and Nov., 1891.

[6] The only exception to this would appear to be Mairet, who is quoted by Leledy as saying that influenza may by itself and without any other cause lead to insanity. I regret to say that I have been unable to procure Mairet's paper, and am therefore unacquainted with his line of argument. What I know of it is derived from quotations given by Leledy.

now proceed to give my reasons for the contrary opinion at which I have arrived.

In five out of the six cases which I have described above, the most careful inquiry did not elicit any predisposition, either in the patients themselves or their families. Since then I have perused the reports of other authors, and have found that out of 107 cases, in which the history of the patients has been mentioned, there was a neurotic predisposition in 67, and no predisposition in 30. This, when expressed in percentages, means that 62.8 were predisposed, and 37.2 were not so. Predisposition, therefore, although undoubtedly an important adjuvant in the production of these psychoses, is plainly shown not to be their exclusive etiological factor. Now the question remains to be answered, why, when so many suffer from grip, comparatively so few afterward become mentally afflicted.

Two modes of accounting for this fact have suggested themselves to me. In the first place, I consider it consonant with the results of clinical observation to say that *idiosyncrasy*—which is well known to exist more or less in all of us, not only with regard to medicines and poisons but also to articles of food—is shown in a peculiarly striking manner by the patient's response to the action of grippo-toxine in the system. There is probably no disease, and certainly no infectious malady, in which the symptoms are so extremely variable as they are found to be in influenza. Indeed, hardly a single case of it is like another. The fever, for instance, does not show any such constant curve as we see in typhoid and intermittent, but is throughout characterized by the highest degree of variability which it is possible to conceive. While in one case it may last no longer than twelve hours, it is in another protracted over three weeks. Again, the fever-heat varies in different cases from 100° to 111°, and there is the greatest irregularity in morning and evening temperatures. The heat is often greater in the morning than at any other part of the day, and sudden changes take place within a few hours to which we are not accustomed in other febrile diseases. The same holds good for other symptoms, and it is indeed the unexpected which constantly happens in grip. While in some cases headache forms the most prominent symptom, pain in the loins, or delirium, or giddiness, or vomiting, or cough, or prostration, do so in others. How are we to account for this except by assuming that the influence of individual idiosyncrasy is carried to a very high pitch in the response of patients to the action of grippo-toxine? Idiosyncrasy, however, is an entirely different thing from a special morbid tendency, and is known to exist in all those who otherwise are in a normal state. Without idiosyncrasies we should not be individuals, and idiosyncrasy moves within physiological lines without being tainted by pathological tendencies. I therefore contend that simply from the effects of idiosyncrasy, persons may

be affected with mental disorder from the effects of grippo-toxine without there being any neurotic tendency either in themselves or their ancestors. As a counterpart to this I may mention that I have seen a considerable number of intensely neurotic persons, who have had not only one but two, and some of them even three attacks of grip, but apparently without any such special idiosyncrasy, and who have not been troubled after convalescence either with psychoses or with any other nerve diseases.

Another way of accounting for this phenomenon has suggested itself to me, which appears *primâ facie* plausible, but is at present not susceptible of proof, owing to our ignorance of the chemical constitution of grippo-toxine and its congeners. I will therefore here content myself with asking the question, Whether grippo-toxine, and indeed all other toxines, are invariably of the same composition, or whether there are different degrees and varieties of toxic power in the poisons formed by the same bacteria? It is easy to imagine that the same species of bacteria may originate poisons of different strength or qualities, according to the peculiarity of the soil in which they breed or their own peculiar inherent vitality at the time they infest the system. I therefore throw out the suggestion that in cases where psychoses follow the feverish attack, *a toxine of specially deleterious influence upon the gray matter of the cortex may have been formed in the system.*

This leads me to discuss another point on which I cannot agree with others who have written on the same subject. Is there anything specific or characteristic in post-grippal psychoses which does not occur in other infectious fevers? Kraepelin,[1] Ladame,[2] and others express the opinion that there is not, and that grip stands in this respect on the same level with measles and other infectious diseases. I think that this opinion has been given without due consideration of the facts of the case, and contend that there are peculiarities in the appearance and nature of the post-grippal psychoses which are not found in other post-febrile mental affections.

With regard to this, I beg to submit the following considerations:

1. The *number of cases* of psychoses observed after grip is far greater than that seen after any other infectious diseases. This might at first sight be accounted for by the circumstance that influenza occurs rather as a pandemic than as an epidemic, and by assuming that, as so many more persons suffer from grip than from other fevers, the number of mental cases is inevitably swelled; but an instant's reflection will show

[1] Kraepelin: "Ueber Psychosen nach Influenza," Deutsche med. Wochenschrift, 1890, No. 11.

[2] Ladame: "Des Psychoses après l'Influenza," Annales medico-psychol., Paris, 1890, p. 20.

that such an argument is untenable. To take only one other infectious disease, it is well known that measles affects habitually the entire population in the course of years, while grip has rarely affected more than 60 per cent. of the people, yet psychoses after measles are very rare. Seeing, therefore, the far greater liability to psychoses after influenza, I contend that the grippo-toxine has a more prejudicial influence on the brain than other morbid poisons. This conclusion is well supported by the argument which I have advanced elsewhere,[1] showing that grippo-toxine has a special affinity for the medulla oblongata, and that by irritating that organ it causes a variety of remote effects in other portions of the nervous system.

2. There is a *much greater variety* of psychoses observed after grip than is met with after other fevers. We have seen that the first class of these maladies, which comprises cases of neurasthenia, hypochondriasis and melancholia, is the same as that which is seen after infectious diseases of comparatively long duration, such as typhoid and rheumatic fever and whooping-cough; while the second class, which comprises cases of delirium, of inanition, and analogous troubles, is the same as that seen after comparatively short fevers, such as pneumonia, the acute exanthemata, and the puerperal state. While, therefore, in other infectious diseases only a limited variety of psychoses is apt to occur, we have in influenza, on the contrary, not only cases of both these classes indiscriminately, but also such of any other form of mental disease occurring in those who are highly predisposed to them, or who have already suffered from similar affections; and finally, a peculiarly rapid—I might almost say galloping—form of general paralysis of the insane.

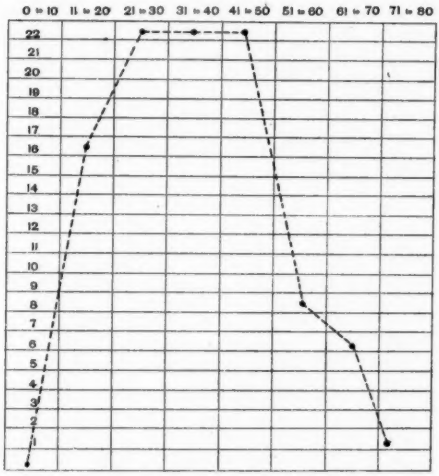
Such an assembly of different kinds of mental affections is not seen after any other infectious fever, and I therefore consider myself justified in stating that grippo-toxine has a more specifically noxious influence upon the nutrition of the cortex than other morbid poisons.

It remains for me to consider the influence of *sex* and *age* on the occurrence of these maladies. In 96 cases in which the ages of the patients have been noted, I have found that there were—

0	cases	between	.	.	.	.	.	1	and	10 years.
16	"	"	.	.	.	.	.	11	"	20 "
22	"	"	.	.	.	.	.	21	"	30 "
22	"	"	.	.	.	.	.	31	"	40 "
22	"	"	.	.	.	.	.	41	"	50 "
8	"	"	.	.	.	.	.	51	"	60 "
6	"	"	.	.	.	.	.	61	"	70 "
1	"	"	.	.	.	.	.	70	"	80 "

1 Althaus: "On the Pathology of Influenza, with Special Reference to its Neurotic Character," Lancet, Nov. 21 and 28, 1891.

The ages between twenty-one and fifty, therefore, furnish by far the largest percentage, being 68.7 per cent. of the entire number.



Curve showing the ages of ninety-six patients who suffered from post-grippal psychoses.

The *sex* of the patients has been noticed in a much larger number of cases, viz., 166. Amongst these there were 96 males and 70 females, showing a percentage of 57.8 for males, and of 42.2 for females. The male sex is therefore more predisposed to post-grippal psychoses than the female.

Is any mental affection ever cured by a feverish attack of influenza? Cases of this kind have been reported by Van Deventer,[1] Helweg,[2] and Metz.[3] The latter relates the case of a laborer aged thirty-three years, married, who was admitted into the asylum of Brake in February, 1889, having threatened to shoot his wife, whom he suspected of unfaithfulness, his landlord, and himself. In the asylum he fought an attendant, and was so excited that he had to be isolated. In January, 1890, he was taken with influenza, the feverish attack of which lasted two days. On the second day after the crisis he wrote a perfectly rational letter to his wife, in which he asked her pardon for having insulted her by his suspicions, and explained this by having

[1] Van Deventer: "Ueber Influenza verbunden mit Geisteskrankheiten," Centralbl. für Nervenheilk., Mai, 1890.

[2] Helweg: "Influenza Virkningen, etc.," Hospitals Tidende, July, 1890.

[3] Metz: "Heilung einer Paranoia nach Influenza," Neurol. Centralbl., 1890, No. 7.

been ill; this illness had lasted until two days ago, when all of a sudden it had ceased. The behavior of the patient after this was perfectly rational, and he was therefore discharged a few weeks afterward. The sudden change coincided with the sudden fall of temperature from 103.2° to 98.8°. Cases like this are difficult to explain, but it seems plausible to assume that the psychosis was connected with an anæmic condition of the brain, to which the hyperæmia of grip acted as a kind of antidote.

PROGNOSIS.—The prognosis of these maladies is fairly favorable. Of my six patients four recovered, apparently permanently, one died, and one recovered temporarily.

The first class, comprising neurasthenia, hypochondriasis, and melancholia, seems to offer, on the whole, the best chances of recovery, the mental disturbance being mostly of a comparatively slight character. There is, however, the risk of the patient committing suicide when in a state of melancholia, as happened in Snell's and Martin's cases which I have mentioned above.

The second class, comprising delirium of inanition, is not quite so favorable in a prognostic point of view, for the physical exhaustion of the patient is much greater and may lead to fatal collapse. There is also the risk of the patients passing into a state of dementia after the period of excitement is over.

For the third class no definite prognosis can be given, as the issue depends chiefly on the individual amount of neurotic predisposition which may exist in a given case. Temporary recovery, however, is not uncommon.

Finally, in the fourth class, the prognosis is thoroughly bad unless the case is energetically treated in the very beginning on a specific plan. Case VI. shows that, if this be done without delay, the lookout of the patient is fairly good.

TREATMENT.—The best rule for treatment is that we should individualize as much as possible, and treat the patient rather than the disease. A nourishing and easily digestible diet is in all cases of the greatest importance. A moderate amount of alcoholic stimulants is useful in most cases where there is loss of appetite and physical debility in addition to mental perversion, and more especially required in the delirium of inanition (Class 2). On the contrary, stimulants of any kind should be prohibited in general paralysis of the insane, where they would unquestionably do harm. Rest, avoidance of excitement, and change of air and scene are amongst our best restoratives where the normal functions of the brain have been impaired. In the delirium of inanition and allied states, where excitement and hallucinations are prevalent, subcutaneous injections of morphine and atropine may be used with considerable advantage. Insomnia should be combated by prolonged warm baths, and, if necessary, by the use of sulphonal and paraldehyde; anorexia by bitter

tonics; general debility by quinine, strychnine, and phosphorus. Where there are symptoms of cardiac debility, as shown by a feeble and rapid pulse, digitalis or strophanthus should be administered. The action of the liver and bowels must be carefully regulated, and alteratives and aperients given when required. Finally, the tone of the nervous centres may be much improved by a judicious application of the constant galvanic current, applied more particularly to the pre-frontal lobes and the medulla oblongata, in doses of one-half to two milliampères, for between five and ten minutes, either daily or every other day.

A CASE OF PORENCEPHALON IN WHICH TREPHINING WAS DONE FOR THE RELIEF OF LOCAL SYMPTOMS; DEATH FROM SCARLET FEVER.

By DeForest Willard, M.D.,

CLINICAL PROFESSOR OF ORTHOPEDIC SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE PRESBYTERIAN HOSPITAL AND TO THE HOME FOR CRIPPLED CHILDREN;

AND

James Hendrie Lloyd, M.D.,

PHYSICIAN TO THE PHILADELPHIA HOSPITAL, TO THE METHODIST EPISCOPAL HOSPITAL, AND TO THE HOME FOR CRIPPLED CHILDREN.

Preliminary Report by Dr. Lloyd.

G. P., aged seven years, was admitted to the the Home for Crippled Children, under the writer's care, in October, 1890. He had bilateral spastic hemiplegia of cerebral origin. His right arm especially was spastic and contractured, and the seat of athetoid movements. The legs also were spastic and the patellar reflexes were exaggerated; ankle clonus was well marked on the left side, but not on the right. The child had but little ability to walk; his legs doubled under him, and he had a tendency to rise on his toes. He had internal strabismus. His mental condition was slightly impaired. His general physical condition was good. The muscular development of the legs was perfect. There was no anæsthesia or atrophy. His head was evidently asymmetrical but there were no scars or depressions upon it. Very little history of the case was known, as, for instance, whether the child had had any trauma or any of the eruptive diseases. Nothing was known of his birth or whether he had had convulsions. About one month after admission, however, he had a series of severe convulsions, after which the athetoid movement in the arm was increased. No signal symptom was noted for lack of opportunity to observe the fits. After each convulsion the child's mental faculties were perceptibly weakened. He was dull and listless, with increased athetoid movements in his arms for some hours or days. An examination of the eyes by Dr. de Schweinitz revealed normal pupils with convergent strabismus, the left eye being used preferably for fixation; fundi, with exception of absorption of pigment epithelium of the choroid, showed no abnormalities; high myopia.

The circumference of the child's head was 19$\frac{11}{16}$ inches; of the left side 9$\frac{9}{16}$ inches; of the right side 11$\frac{2}{16}$ inches. The prominent symptoms of the case were thus seen to be a local athetoid movement confined to the right arm, with severe epileptic attacks, increasing for some hours the athetoid condition and impairing the child's mental faculties. After two months' observation, during which time the child's course was progressively downward, a consultation was held with Drs. Willard, Keen, Mills, and Deaver. The general opinion of the consultants was in favor of an exploratory trephining. It was thought that there was possibly some atrophy of brain tissue or thickening of membrane, or possibly a porencephalon. The motive for the operation was to explore and then to relieve, if possible, the local condition which was the immediate cause of the epileptic explosions and of the constant athetoid movements of the arm. It was even thought that the case might possibly be relieved, if in no other way, by the linear operation of Lannelongue. In case, however, of the existence of a porencephalon it was the intention to immediately close the wound. On December 12th the operation was performed by Dr. DeForest Willard, consulting surgeon to the institution, assisted by Drs. Keen and Taylor, in the presence of Drs. Mills, Deaver, Dixon, Davis, and Lloyd.

Surgical Report by Dr. Willard.

Exploratory trephining was proposed with the hope, not of improving the general mental condition, but for the relief of the athetoid movements and of the epilepsy.

Horsley's measurements were used and the fissure-meter employed to mark off the line of the fissure of Rolando. A delicate gouge drill was used through the scalp to mark the upper and lower ends of the fissure upon the skull before making the incision. A large flap with the base downward was raised, and the periosteum stripped off with an elevator. A one and one-half inch trephine was applied one and one-third inches to the left of the median line. As I have found on previous occasions in children, the skull was exceedingly thin, only one and one-half millimetres, and the centre-pin penetrated the dura before the serrated edge of the instrument had made a groove through even one-third of its circumference. On account of the shape of the skull the trephine was therefore abandoned and rongeur forceps were used to gnaw an opening in the bone.

As soon as the pin penetrated the dura a jet of cerebro-spinal fluid spurted through the puncture at each pulsation. When the opening in the skull was of sufficient size to admit the flat-bladed rongeur forceps, pieces were nipped away and the gap was made one and one-half inches wide. A straight incision was made in the dura, and the cerebro-spinal fluid flowed out to the extent of several ounces. A finger introduced into the opening entered a vast cavity without brain substance in any direction. This cavity will be described later by Dr. Lloyd. On looking into this deep well through the clear fluid a dark opening appeared at the bottom, apparently the ventricle, and it was at once seen that a large portion of the cerebrum was absent.

As no further operative procedures were possible it was decided to close and seal the wound. The wound of the dura was approximated with continuous catgut sutures, but it could not be entirely closed

without tearing. The scalp wound was closed with silk sutures without drainage. Iodoform was dusted along the line of the wound and dry sublimate gauze applied with a tight bandage. Thorough antiseptic precautions were taken on the day previous as well as at the time of operation.

Within five hours after the operation the pulse rose to 156, and the temperature to 102°, which could not have been from septic cause. He had but little pain, but vomited two or three times, evidently from the effects of the ether. He slept at intervals during the night, and on the following day the temperature was 103°, and the pulse from 150 to 170, yet he was perfectly conscious and answered questions with his usual intelligence, differing in no perceptible degree from his previous condition.

His temperature remaining high, it was feared at the end of forty-eight hours that there might be some difficulty with the wound. The dressings were accordingly removed and the large flap was found to be entirely united throughout its extent. There had been absolutely no oozing of cerebro-spinal fluid; there was not even a stain on the dressing. The entire serous stain upon the gauze, over the large wound, would probably not exceed a quarter of a drachm; there was no pus nor redness along the incision nor the slightest sign of irritation of any kind. The wound was absolutely clean.

On the fourth day the temperature rose rapidly to 104.2°, accompanied by an eruption over almost the entire surface of his body. This eruption was slightly elevated, with thickening of the derma. A few hours later there was a profuse crop of sudamina, especially on the inner and anterior portion of the thigh and lower abdomen. These miliary papules soon filled with serum and became turbid; the vesicles ruptured within twenty-four hours; this was followed by rapid separation of the epithelium in patches, which epithelium speedily dried *in situ* in large flakes. This eruption was accompanied with a moderate degree of itching. The tongue was polished, red, and strawberry in appearance. The eruption was more prominent upon the lower extremities than upon the breast, face, and neck; in fact, there was but little upon the face. On this day, for the first time, the dressings became soiled by oozing. They were accordingly removed, and the wound was found to be healed throughout its entire extent. The clear spinal fluid oozed through the needle punctures of the scalp, the sutures acting as capillary drains, and conducting the fluid through the tissues. The stitches were accordingly removed in the hope that such action would permit the points to heal. The drainage through these points was probably about two ounces. The wound was absolutely free from inflammatory secretions and was in every respect healthy. Antiseptic dressings were applied and firm pressure made.

On the day following the eruption the vesicles had dried. The eruption was very slightly present on the body, but the epithelium was already beginning to desquamate. The temperature ran to 104.4°, it having sunk at one time on the day previous to 99°. The child was perfectly conscious and as intelligent as before the operation. The tongue presented no change, and there was but little redness of the fossæ. The pulse was 180. Serum again oozed through the dressings. They were again removed, and it was found that the suture openings had all closed except one in the posterior part of the wound. Intra-cranial pressure

had burst through the weakened cicatrix at one point, which had been perfectly healed, but which was now opened to the extent of one eighth of an inch, through which the serum constantly exuded. The wound was perfectly sweet and aseptic. The serum was slightly tinged with blood. Iodoform collodion was freely applied over several layers of gauze in the attempt to arrest this oozing and prevent this continuous drain of spinal cerebral fluid.

On the seventh day the temperature was 104° F.; the pulse 160. There had been no oozing from the wound since the collodion was applied. The child was perfectly rational and suffered less pain than yesterday. The skin felt dry and harsh. The epithelium desquamated at various points, but was still a little red with slightly elevated points. There had been no marked vomiting; no hardness of the glands of the neck nor indurations behind the jaws. The dressing was not disturbed.

On the eighth day the child was desquamating slightly over the entire surface of the body. The temperature fell to 101°. The child cried at times with pain apparently in his ear. He was more bright, more intelligent, talked in a much better tone of voice and much more intelligently than before the operation. The pulse went down to 136; respiration 24. He fretted and worried, but took food well. The urine contained no albumin; it was heavily loaded with urea.

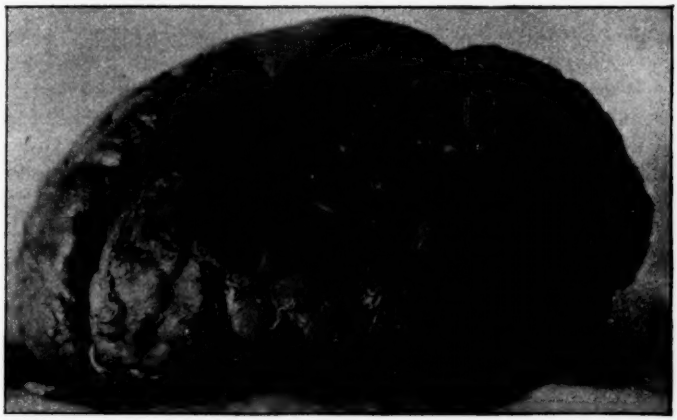
The intra-cranial pressure was so great that when one opening was closed by collodion, a portion previously healed would be pushed through by the oozing of the cerebro-spinal fluid. No evidences whatever of inflammation were present. The wound was re-sealed and re-dressed. The patient desquamated rapidly and large masses of the epithelium came away. The child steadily failed and lost flesh. Diarrhœa set in with involuntary discharges, and he sank steadily until the nineteenth day with all the symptoms seen in severe grades of diphtheria or scarlet fever. The wound remained perfectly healthy. The child evidently died from the poisoning of scarlet fever.

Clinical Report and Autopsy by Dr. Lloyd.

The child's first movement on coming out of the ether was with the right or athetoid arm. His condition immediately after the operation was fairly good. He cried loudly. The temperature was good; pulse improving. After the first few hours, however, his condition was never good. His temperature began to rise the same afternoon and reached as high as 102°. His pulse became very rapid; he was restless, slept badly, vomited frequently, and had twitching and jerking movements in the arm. His mental condition, however, was clear and notably better than before the operation. The features of the case, during the remainder of its course, may be briefly summed up in the fact that on the third day after the operation the child was found to have developed a distinct scarlet fever. The surgical condition remained good and continued fairly good to the end. Not a drop of pus or any undue inflammation was observed about the wound. In spite of this favorable surgical condition, however, the child sank lower and lower under the influence of the scarlet-fever poison. A history of this aspect of the case has been published already by the writer and need not be dwelt upon here.[1] The case pursued a somewhat typical course of scarlet

[1] Transactions of the Philadelphia County Medical Society, 1891.

fever. The eruption was characteristic, and marked by but one peculiarity—the presence of sudamina. The sudamina were at first lightly sprinkled over the body, but later they appeared in very thick crops on the lower part of the abdomen and inner part of the thighs. The temperature rose to 104°, even 105°; the rash persisted for several days, gradually fading out. It covered almost the entire surface, the back especially, which was free from sudamina, showing a typical scarlatinous eruption. The face was much flushed, but around the mouth the white skin was preserved, as is so common in scarlet fever. The throat was flushed but not ulcerated. The cervical glands were little, if at all, involved. The tongue had the characteristic "strawberry" appearance. The patient became slightly more restless and difficult to manage, complaining constantly of pain in the head. The escape of



cerebro-spinal fluid from the needle-wound continued very profuse, but otherwise the wound was healing and was thoroughly aseptic. The patient had vomited several days before the eruption appeared. Desquamation began on the fourth day of the eruption at the place where the sudamina had been thickest, and became general and profuse. The child's condition improved, but only to a certain point. The urine was not albuminous. After the eighth day of the eruption, about twelve days after the operation, the patient sank lower and lower. Desquamation proceeded perfectly and the urine was never albuminous, but the patient passed into a dyscrasia, with variable temperature, involuntary stools, diarrhœa, increasing mental torpor, continued head-pain, dread of light, aversion to food, and restless, disturbed sleep. He failed gradually and died eighteen days after the operation.

The autopsy was made a few hours after death. The brain showed not a trace of septic infection. There was no meningitis. The wound was aseptic although it had not healed at all the needle-points. The body presented nothing of special interest, except the brain, which alone will be described. The left hemisphere presents an immense porencephalon.

This porencephalon involves the Rolandic region. It extends anteriorly beyond the pre-frontal fissure, downward almost or quite to the operculum; backward to include the superior parietal lobule; in other words its area coincides very closely with the distribution of the middle cerebral artery, the superior convolutions of the temporal lobe alone having escaped. Its edges and sides are formed of the convolutions of the brain which have sunk downward and still preserve, especially in the anterior part, their form and relative positions. In the mid-region of the cavity is a large crater-like opening, extending into the lateral ventricle. The membranes at the edge of the cavity are shrivelled up, and form a distinct line or ridge, separating the cavity from the surface of the brain. The gray matter of the mesial aspect of the brain is atrophied and almost destroyed. The gyrus fornicatus is preserved. The left hemisphere is smaller than the right. The measurement from the tip of the frontal to the tip of the occipital lobe shows a difference between the two hemispheres of about three-quarters of an inch. The structures at the base of the brain on the left side are slightly atrophied.

Of the various theories which have been proposed to explain this condition of porencephalon, three only need claim our attention. First of these is the theory of Strümpell of a polioencephalitis analogous to the poliomyelitis of children. The case before us is not explained by this theory, as neither the convolutions nor the membranes covering them present the appearance of having been destroyed or injured by an inflammatory action. Second, the theory of Richter of a basilar kyphosis. According to this theory a defective cartilaginous union, probably of rhachitic origin, causes a twist of the base of the skull, the sella Turcica being thus deflected. The corpus callosum is brought into contact with the falx, which causes atrophy radiating from the corpus callosum into both hemispheres. An obstruction of the veins of Galen is also caused; consequent dilatation of the ventricles and destruction of tissue ensues. This theory may or may not be considered by some to be illustrated in our case. It seems to me, however, that the theory is far-fetched, and that even if it will explain some of these cases, it is not available to explain all of them, especially cases where the porencephalon is unilateral, as in our case. Third: The last, and to my mind the most conclusive theory, is that of vascular disease or injury. Anyone who looks at this brain must be convinced that the left hemisphere has been undermined in the Rolandic region and that its top and sides have caved in. The diseased processes which might produce this condition are several. It might be caused by an obstruction of a large artery of supply. Its location, especially in the area of the middle cerebral artery, lends countenance to this view. Such embolus is not uncommon in several of the infectious diseases of childhood, the most common of which are rheumatism and scarlet fever and the other eruptive diseases. Pneumonia, which is probably infectious in some cases, has been known to be followed by grave cerebral disorders. The pro-

tracted summer diarrhœas of children have also presented occasionally these sequelæ. Venous thrombosis has also been supposed, with reason, to give origin to these serious degenerative and destructive lesions. Finally cerebral hemorrhages have played a very important part in the production of these cerebral palsies of children. The asphyxia of the newborn babe is a potent and frequent cause. This asphyxia, which too often has been ascribed erroneously to pressure upon the head during labor, or to the action of the obstetric forceps, is probably more frequently the result of compression of the placenta in protracted labor, interfering with the proper aëration of the child's blood. In this condition ecchymoses have been observed, not only beneath the membranes of the brain, but also in the pleural cavity and in the capsule of the liver. This compression of the placenta in protracted labor has not been recognized sufficiently as the cause of serious or even fatal injuries to the brain of the newborn. In its practical bearings, which cannot be discussed here, it suggests timely interference, even with instrumental aid, as conservative, rather than dangerous, to the child's brain.

NEPHRITIS AND PYONEPHRITIS COMPLICATING PELVIC INFLAMMATION IN WOMEN.

By William Alexander, M.D., F.R.C.S.,
SURGEON TO THE ROYAL SOUTHERN AND WORKHOUSE HOSPITALS, LIVERPOOL.

Changes in the kidneys produced in the male by urethral stricture are so familiar as to be quite commonplace. In these cases the kidneys are slowly destroyed in virtue of the intermittent nature of the compression and retention, the bladder so loudly calling for relief that the patient is compelled to seek it before the kidneys are affected by direct pressure. Dilated calyces, decomposing urine, cystitis, and health-failure, with the formation of renal or vesical calculi, include the prominent symptoms; and while suppuration takes place to a limited extent in interstices of the kidneys and in saccules of the bladder, it is never a distinctive feature of the disease. Both kidneys are generally, though usually unequally, affected, and the system is so deteriorated by the renal inadequacy that any operation, either on the kidneys or on the patients affected with this disease, is attended with increased risk.

Probably a less common disease than this so-called surgical kidney, but a more common disease, perhaps, than we have hitherto suspected, is nephritis or pyonephritis in females, dependent on obstruction of one ureter through intra-pelvic inflammation.

A case that, unfortunately, ended fatally enables us to give a complete

history of the disease. A fatal issue is not uncommon, because the disease is not fully appreciated in the most remediable stages, nor is the course of treatment always clear.

For the following notes we are indebted to Mr. Burton, house surgeon, and my research scholar, Mr. Crook.

The patient was a general servant, aged twenty-three years, single, of good character and family history. She was accustomed to "do washing" in the yard, where she often got her feet wet, and as often felt very chilly in consequence. She particularly remembered having had a shivering fit about the beginning of December last, from which time she dated the onset of her illness. The rooms she then inhabited were very cold and her food insufficient.

About a week after this—that is, the middle of December—her water began to trouble her. She passed it every half hour, felt a good deal of smarting during and after micturition, had to rise frequently at night, and she believed the urine was then much increased in quantity. It was milky in color, but had no foul smell. About the beginning of the year she first noticed a little pus in the urine, or a "pellet of white material" sometimes streaked with blood, which continued to appear pretty regularly up to her entering the hospital. She mentioned a dull pain over the bladder as being in existence about that time, but it was never very distinct or severe.

Up to the 9th of March she improved somewhat and went to service again, having been idle from before Christmas—*i. e.*, a fortnight after her illness began. For a month she felt much better, but after that gradually became worse. At the end of April she had, for the first time, aching burning pains across the loins, lasting all the month of May. Her face at this time felt hot and flushed. She could not sleep for the pain, and her urine became worse in color, smarted more, and had to be passed more frequently.

Then suddenly she passed about half a pint of pus and blood, and since that time the urine has often contained pus streaked with blood, but never in so great quantity. She went to bed and remained there until a fortnight ago. While in bed the symptoms of pain in the back, frequent micturition, and smarting continued, but there was no pain over the bladder. The quantity of urine passed was, she thought, too small. In the middle of July she for the first time felt sharp pains in the right side. This pain would shoot up toward the kidney, and a swelling was soon apparent at the seat of pain. The pain passed off altogether for a week, then returned, and has remained ever since. There was always pain at that time on drawing a deep breath, coughing, etc.

On July 12th she passed at intervals of a few minutes about a quart of clear urine, but did not notice that the swelling in the side varied.

She was very positive that she had never been irregular in menstruation. The quantity was always normal; never any pus or discharge *per vaginam*, and she never had any extraordinary pain at the menstrual periods. Bowels always regular and appetite good before her illness commenced.

On admission, the right kidney was felt to be about twice the usual size and very tender to pressure. It was lower in position, and owing to the somewhat emaciated condition and collapsed abdomen could not

only be felt, but seen. The case was sent into hospital by Dr. William Williams with a diagnosis of renal calculus. On deep palpation in the right pelvic area, a fulness could be detected, but no pain was elicited, and the patient rather resented the idea of anything being wrong there. Vaginal examination revealed a distinct semi-fluctuating swelling in the right broad ligament. There was no special pain or tenderness on examination in this region. Rest and warm glycero-iodine douches were prescribed, and during the subsequent week the following points were noted: The temperature fluctuated between 97° and 98° in the morning and 101°, 102°, and 103° in the evening; the amount of urine passed was from twenty-eight to thirty-five ounces per diem; specific gravity, 1015 to 1016; it was slightly alkaline in reaction for the first four days, and then became acid, and always contained a considerable amount of pus. Appetite fair in spite of the temperature, bowels regular, and temperament equable and sanguine.

A consultation was held at the end of the week (21st), but the temperature had fallen, and until the 31st its range was from 97° to 99°. The renal swelling had diminished in size, and was much less tender, and the patient felt so much better that any active interference was postponed. The average quantity of urine passed daily during this period was forty-two ounces; specific gravity, 1018. On the 31st the temperature rose to 102.4°, and for the next few days it resumed its hectic condition, ranging from 97° to 101° or 102°. Traces of albumin appeared in the urine, its specific gravity was reduced to 1016 or 1017, and the average daily quantity, as well as the quantity of pus, remained about the same. The kidney was distinctly larger. As the patient was now losing ground it was decided to perform nephrotomy, which was done on August 8th. The lumbar incision was made and the kidney incised, when a considerable quantity of pus was evacuated, but no stone was felt or seen. A small abscess was found pointing in the vagina; it was opened on a grooved needle, when matter and some urine came away. A little urine dribbled through the opening for some time after. The average temperature from the time of operation until August 14th varied from 97° to 99.5°. The daily discharge of pus was free, the large dressings being wet through with urine and matter. The irritability of the bladder was much lessened and the patient felt much better. Milk diet.

On August 17th patient had a "bilious attack," characterized by sickness and vomiting, thought to be due to irritation of tube. This was shortened, and vomiting ceased. The temperature during this day and the next was very low, viz., 96°, 95.2°, 95°, 95.6°, rising to 97° on the evening of the 18th. On August 19th the temperature rose to 101°, and until the 26th assumed a higher range, from an average of 97° in the morning to 101° to 104° in the evening. On the 25th the tube opening was dilated with the finger and the kidney washed out with boric lotion every four hours without any effect in lowering the temperature.

On August 27th the kidney was removed by reopening the lumbar incision and tying the vessels and ureter in the usual way. No blood was lost. The kidney was much enlarged, the ureter dilated, and the renal substance was the seat of several large abscesses and several small ones filled with caseating material. There was no calculus.

The patient apparently bore the operation well, and passed two or three ounces of urine about four hours after operation. Toward midnight vomiting and collapse set in, and the pulse became very small and

weak. From the smell there seemed to be urine in the vomit, but it was thrown away before it could be examined. Next morning at 7.30 no urine was found in the bladder, and she had passed none since the early part of the night. She said she felt better, but her hands and feet were very cold, skin perspiring freely, and mind quite clear. She had a frightened look, and her pulse was quite imperceptible. She continued collapsed during the day, and died at 3 o'clock—*i. e.*, twenty-eight hours after operation—apparently from shock and suppression of urine.

A post-mortem examination was made eighteen hours after death. Body much emaciated. Wound in the right loin, four inches long, parallel to last rib, and clean. On opening the abdomen the omentum was found to be fixed in the pelvis, adherent to the uterus and bladder. Its fixed part was infiltrated with pus and nodules that seemed of a tubercular character. There was double pyosalpinx, and pus of a cheesy character was exuding from both Fallopian tubes. The right broad ligament was a thick, solid membrane. Adhesive, old-standing peritonitis was present over nearly all the abdomen, fixing the liver to diaphragm and the coils of intestine to each other at various parts. Some more recent lymph in pelvis, and pockets of pus here and there were found among the intestines, with tubercular nodules; some pus in Douglas's pouch. The right ureter ran through a mass of inflammatory tissue about an inch thick just before entering the bladder; its lumen was pervious, but much contracted. Above the broad ligament the ureter was dilated.

The substance of the left kidney was apparently healthy, but some pus was found in the pelvis and along the left ureter, which was somewhat dilated. The uterus, ovaries, tubes, and bladder were all firmly fixed to the sides and floor of the pelvis, and so matted together that it was most difficult to separate one from the other. No tubercles on lungs, spleen, left kidney, or liver. Other organs healthy. No tubercular ulceration of bowels.

Remarks.—The first thought that strikes one on reading this case is the slow, insidious nature of the disease. Beginning with a chill early in December, the patient seemed to be simply out of health for several months, and the only symptoms pointing to the actual disease were the frequency of micturition with an accompanying pain and smarting. These symptoms she, a young girl, probably said nothing about to her friends or to her doctor, if she had one. The question of an infective blennorrhœa here asserts itself. We can only reply that there was nothing to lead us to suspect it except the above-mentioned symptoms and the theory that pyosalpinx is mostly gonorrhœal, and we did not feel justified in seeking information upon this subject from the patient. The next remarkable feature of the case was the absence of symptoms pointing to pelvic disease. Pelvic disease was never suspected until the patient came into hospital, and was only discovered by the examination conducted there. The renal swelling absorbed the patient's whole attention at this time.

The cause of the disease was probably a chill at the menstrual period, producing a check to that secretion and consequent congestion of the

generative organs, decomposition of the sanguineous discharge covering the walls of the vagina and uterus and external genitals, and infection by the ordinary abscess-germs of the tubes, broad ligaments, etc. If any specific germs were present in the tissues the explanation would hold good, except that the symptoms would be more likely to follow such specific infection.

This intra-pelvic inflammation is a very common complaint, well recognized by gynecologists, and is undoubtedly produced in pure virgins by colds, menstrual derangements, and other simple causes, although irregular living, specific infection, miscarriages, and parturition are the most common causes. In the great majority of cases the disease, as far as we know, begins and ends with the pelvic organs, but it would be a matter for careful observation whether the kidneys always escape being interfered with as perfectly as they seem to do.

When the kidneys are interfered with, the interference may arise in several possible ways:

1. The surrounding inflammation may produce an irritable, contracted bladder that prevents a free flow of renal secretion and a waterlogged state of the kidneys that may end in dilatation, degeneration, and suppuration, as the case may be. This method of interference would result in symmetrical disease; is hardly, if ever, productive of any rapidly developing gross lesion, and I do not think would apply as an explanation to the class of cases under discussion.

2. The surrounding inflammation may produce a cystitis or ureteritis that, creeping upward along the mucous membranes of the bladder and ureter, may by continuity terminate in a pyelitis or nephritis. No symptoms of such a course appeared in the case we have described, and the bladder and ureter on post-mortem examination did not present any signs that gave grounds for such an explanation. The lining membrane of the ureter was healthy.

3. The pelvic inflammation may spread by continuity along the tissues outside of the ureters and produce perinephritic inflammation, but the appearances presented at the operation and at the post-mortem negatived the supposition of its production in this way. There were no signs of perinephritis or peri-ureteritis visible on any of these occasions; the kidney and ureter were enlarged, but both enlargements were produced by dilatation, and took place from within and not from without.

4. The renal disease was produced by intra-pelvic inflammatory effusion into the broad ligament pressing upon the ureter close to the bladder in such a way as to produce obstruction to the passage of urine, partial or complete.

This is in all probability the true explanation. The post-mortem showed the ureter on the affected side constricted by a mass of inflammatory effusion an inch thick. At the post-mortem, and long before,

the tension of this inflammatory effusion was small compared with what it had been in the early stages of the pelvic disease; but the dilated ureter above the effusion, and its narrowed portion below, showed what had once occurred.

Assuming that the compression of the ureter by inflammatory intrapelvic material was a necessary step in the production of the nephritis, the succeeding phenomena would be: stasis of the renal secretion more or less complete in the ureter and pelvic calyces, distention of these regions, and a condition of hydronephrosis. The patient described an occasional excessive flow of urine that may point to this condition, but the terms of the description were too indefinite to be relied upon to perhaps indicate anything more than the usual fluctuations of the secretion that often occur, especially in a nervous young woman.

The stoppage of the flow of the secretion tended to cause decomposition of the urine confined in the ureter and renal pelvis. This decomposition alone would tend to set up inflammation, especially when formed by the irritation of increasing tension and by the febrile state of the blood and tissues accompanying the pyosalpingitis. Suppuration evidently took place in the secreting substance of the kidney, and was a nephritis, not a pyelitis. The tension and irritation of the retained urine supplied the predisposing cause and the febrile state of the system the infecting or exciting cause. The former represented the tinder and the latter the match, and the two combined lighted up the disease. Mention is made of tubercles on the peritoneum, and the smaller renal foci of suppuration seemed tubercular, and probably in these places the tissues contained the tubercular microbe. We are, however, inclined to consider the tubercular disease a secondary infection limited in extent as yet, but spreading in the tissues already devitalized by the simple inflammation. Tubercular kidneys have, I think, often the same origin, and I can recall some striking instances where their removal has completely cured the patients, although at the time of operation the outlook was supposed to be most gloomy. The obstruction to the flow of urine or pus was probably never complete. Pus was noticed in the urine very early in the disease, and once a very large quantity, noticed distinctly by the patient, came away at one time. This arose rather from the rupture into the ureter of a renal abscess or perhaps from an increased patency of the lower end of the ureter and a consequent flow from the engorged pelvis of the kidney and upper part of the ureter. A slight pyelitis was present, on post-mortem, in the pelvis of the opposite kidney, probably due to the irritable bladder, but the renal substance on this side was sound.

The frequency of the disease has of late seemed to me to be greater than I had previously thought it to be. When I look back on my practice for some years, I can recall many instances of it.

An old nurse, who had been married and afterward suffered from pelvic cellulitis, consulted me many years ago with the identical lesions present in this case. By rest and care the symptoms abated, and she left for her home in the sister isle, to die next year from, as far as I could learn, an enormous pyonephritis that so perplexed the different medical men who saw it that nothing was done until she was moribund. I believe an opening was made in the kidney too late to influence the result and only sufficient to establish the diagnosis.

On February 28, 1888, a woman, aged twenty-eight years, single, a warehouse hand, was admitted into hospital moribund, and died before I had an opportunity of making a diagnosis. She was bloated and her legs pitted from anasarca. The renal calyces and pelves were dilated, and the secreting substance of both kidneys reduced to a thin peripheral layer. The upper parts of both ureters were dilated, and two sacs of pus—a double pyosalpinx—were found in the pelvis. The tissues in the pelvis were very much adherent to each other.

In 1884 a woman, aged thirty-two years, came under my care suffering from right salpingitis and pelvic cellulitis, ascribed to a confinement seven years before. By rest, etc., she was relieved, but came back again next year and had the right appendages removed, recovering completely, as we thought. In 1886 she again returned, with a right pyonephrosis that had burst and formed sinuses all around that side of the abdomen, rendering her condition hopeless.

In March, 1885, a woman, aged twenty-four years, came under my care suffering from an enlargement at the left side of the uterus, the result of a fall. After five months' rest the inflamed hæmatocele (as it was diagnosticated) subsided, and the patient resumed her work. She was readmitted on January 14, 1887, when we found the left Fallopian tube much thickened; menses scanty and irregular, and of a light color; great dysuria and anorexia. Expectant treatment was tried up to June 16th, when, no distinct improvement being secured, the left tube and ovary were removed. The left kidney was then enlarged and the urine contained pus, but it was hoped that with removal of the irritating pelvic trouble recovery of the kidney might ensue. The kidney, however, became rapidly worse, and, on exploration, it was found so much disorganized that it was removed on July 27th, and the woman recovered completely.

A woman, aged fifty-one years, was admitted into the Royal Southern Hospital on September 23, 1890, suffering from frequency of micturition, occasional incontinence of urine, and pelvic pain. A swelling was found to the left of the uterus, fixing that organ in the pelvis. The bladder was dilated, its walls velvety, and the urine, of specific gravity 1010, acid, contained albumin, gravel, and pus. Cancer of ovary, broad ligament, or bladder was suspected, but with rest and care all the symptoms and signs disappeared in four months, and the patient was discharged well.

In the following case a different cause produced the kidney trouble, but in much the same way:

Mrs. W., aged thirty-six years, was admitted to the Royal Southern Hospital, on May 8th, complaining of pain in the urethra and irritable

bladder, symptoms that had lasted more or less for eight or nine years, and had now produced much debility and mental depression, with sickness, diarrhœa, etc. In 1881 she had what her medical attendant called "swollen ovaries" and a "lump on the bladder." The urine was 1012 specific gravity, contained one-third albumin and a considerable amount of pus. Examination under chloroform showed that the bladder was distended, but normal in every other respect. All the other pelvic and abdominal organs were apparently normal, except that between the os uteri and the urethra, situated beneath the anterior vaginal wall, was a small nodule about the size of a walnut. On the urethra being dilated the nodule was felt to press upon the vesical trigone from below and in such a position as to obstruct the urethral orifice. On May 15th this tumor was shelled out after an incision had been made over it through the vaginal mucous membrane. The bladder was not opened, and the small fibroid tumor—for such it was—lay quite free between the vaginal and vesical mucous membranes. Very slight relief followed. She was discharged June 5th, weaker than on admission, and died soon after from the renal disorganization.

These are only a few representative cases culled at random from my notes. I intended here to try to tabulate the comparative frequency of renal disturbance in pelvic inflammation, but I find that my cases, not being prepared for this purpose, are sometimes deficient in information about the state of the urine. This is a subject for future study. I have said enough to show that the disease is sufficiently common and important to have attention directed to it, especially as most of the text-books are either silent on the subject or pass it over with a few remarks that only indirectly refer to the matter.

Treatment.—When diagnosticated early the treatment is absolute rest in bed, careful diet, hot vaginal douches, aperients and febrifuges as required, and tonics, of which quinine is the chief. Early and strict adoption of the treatment will rarely fail to cure. When the disease keeps advancing in spite of this treatment, or when the disease has so far advanced as to render these measures hopeless, then abdominal section and exploration of the pelvis, with drainage or removal of the inflamed appendages, may suffice. In other cases the affected kidney will also require drainage or removal. The advanced cases are very unsatisfactory, the early cases very tractable. Let us endeavor to diagnose these cases in the early stage and to prevent their passing beyond that stage.

A CONTRIBUTION TO SPINAL-CORD SURGERY.

By Archibald Church, M.D.,
PROFESSOR OF NEUROLOGY, CHICAGO POLYCLINIC;

AND

D. W. Eisendrath, M.D.,
RESIDENT STAFF, COOK COUNTY HOSPITAL, CHICAGO.

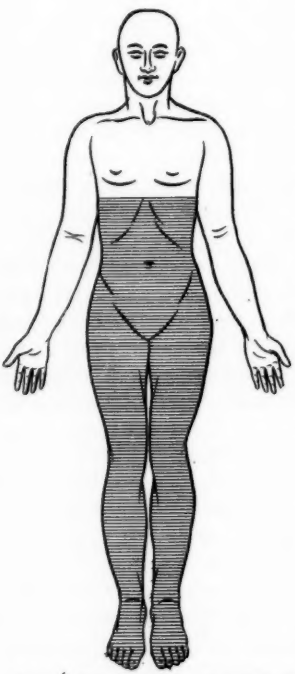
The subject of surgery of the spinal cord has recently received so much attention and discussion, finding urgent advocates in some and opponents in other directions, that every case bearing on the question is of value, particularly as much of the argument, until very recently, has been based mainly on theoretical grounds and misconceptions. The number of thoroughly reported cases is yet small, and ultimate results often unknown, making deductions difficult and uncertain. The mortality rate is, of necessity, very high with operation, and without it a fatal termination, in any considerable injury to this important structure, is the almost invariable rule. Occasionally, however, surgical interference has saved a life that would otherwise have undoubtedly been lost, and post-mortem findings not rarely lead to the conclusion that properly directed operation might have gained further victories.

Regarding the history, technique, and bibliography of the subject, it is not our purpose to speak, except as variations or peculiarities in our cases call for comment. The whole matter has been recently so well set forth by Prof. J. William White, of Philadelphia; and by Thorburn, Horsley, Abbe, Lloyd, and others, to whose works we gladly refer for these details, and to whom we have personal acknowledgments to make, that a repetition would be superfluous. These cases are of value from the physiological standpoint also, for in some instances they correspond by the exactness of conditions to experimental investigations upon lower animals, with the added advantage of being free from the obvious drawbacks of such experiments and their probable lack of parallelism with what occurs in man.

Investigations as to motion, sensation, reflexes, and other similar points were carried out as fully as the condition of the patients would warrant, and were in every instance frequently repeated and verified by a number of observers. In order to be as brief as is consistent with clearness, negative conditions are omitted, as a rule, from our reports, each of which, it is hoped, may convey its own lesson. We desire to express our obligation to the various surgeons in immediate control of the patients, for their courtesy and the privilege of publishing their operations.

CASE I. *Gunshot injury to the spinal cord at level of third dorsal segment; paralysis of limbs and trunk; lamnectomy; death twenty-one days after operation.*—I. K., aged twenty-eight years, received one bullet-wound from a revolver of large calibre, fired at a distance of five feet to the left and somewhat in front of the patient. He remembered falling to the ground, but nothing further until brought to the hospital, where examination showed a wound in the fourth left intercostal space in the mid-axillary line. There was pneumothorax, but no evidence of hemorrhage into the pleural cavity. The case was treated as one of gunshot wound of the chest until the patient was asked to turn upon his side, when it was found that both lower limbs and the muscles of the lower half of the trunk, with the exception of the abdominals, were completely paralyzed. Respiration was abdominal and not labored. There was no paralysis of any of the muscles of the upper extremities. As shown in the figure (Fig. 1), there was complete anæsthesia of the trunk and both lower extremities, the highest level of this area being at the lower border of the seventh rib. No hyperæsthesia above this level could ever be detected while in the hospital. Upon admission he had no subjective sensation except that of numbness in both arms. All the superficial and deep reflexes were lost below the level of the lesion. Marked priapism, but no seminal emissions. There was retention of both urine and feces for three days, and no sensation on passing the catheter. The pulse was 96; temperature normal. Sixteen hours after admission an exploratory lamnectomy was performed by Dr. Weller Van Hook, in order to ascertain whether the pressure symptoms were due to hemorrhage or to a fracture. After the usual preparations and the use of chloroform as an anæsthetic, the patient was placed in a semi-prone position. An incision was made five inches long, its centre opposite the third dorsal spine. The spinous process and laminæ of this vertebra were removed and the cord and its membrane, apparently in a normal condition, exposed. The posterior arch of the second dorsal vertebra was then removed by means of a chisel and rongeur forceps. The spinal canal being thus opened, the cord was found reduced to an unrecognizable pulpified mass for a distance of one and a half inches. Suturing of the severed ends being impossible, the wound was irrigated with warm (110°) sterilized water, the dura sutured with fine catgut, deep muscular and superficial cuta-

FIG. 1.

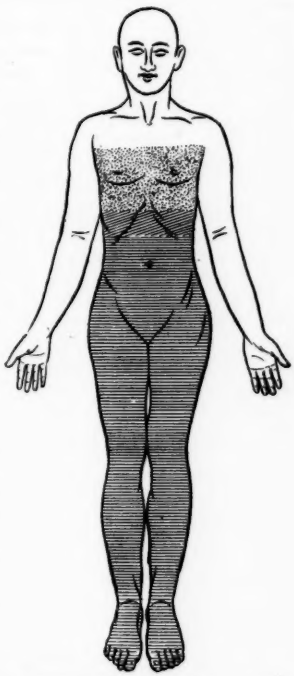


Case I. Showing area of anæsthesia in lines.

neous sutures of silk being inserted, with the use of iodoform gauze at the upper and lower angles of the wound as a drain. The patient was in excellent condition after the operation, although respiration was suspended once. His symptoms changed but little during the remainder of his stay in the hospital. After the operation he was placed upon a water-bed. There was marked tympanites at intervals, and alternately retention and involuntary evacuation of both feces and urine. His temperature varied between 99° and 102°. Seventeen days after the operation the patient requested his discharge. He died at home four days after.

A post-mortem examination was held by the coroner's physician, Dr. Ludvig Hektoen, who found the bullet imbedded in the substance of the cord opposite the second dorsal vertebra. There was much subdural hemorrhage at this point, and acute cystitis and pyelo-nephritis.

Fig. 2.



Case II. Showing area of anæsthesia by transverse lines, of incomplete anæsthesia by diagonal lines, and of hyperæthesia by dots.

Case II. *Gunshot injury to the spinal cord at level of fifth dorsal vertebra; paralysis of lower limbs and trunk; lamnectomy; death thirty-one days after operation.*—W. D., aged nineteen years, was admitted to the service of Dr. T. J. Conley on September 2, 1891. He had received, about one hour before, two bullet-wounds from a revolver, held about six feet behind and somewhat to the left. One bullet entered the outer aspect of the left arm and was found subcutaneously on the inner aspect. The other entered about one-half inch to the left of the spinous process of the fifth dorsal vertebra. He was "immedately" paralyzed in both lower limbs, according to his own statement, and upon being turned over the escape of a clear, watery cerebro-spinal fluid was noticed by a bystander. On admission he was found to be well nourished, rational, and complained of a "dead rumbling" in both legs. Respiration abdominal, with no evidence of dyspnœa. The above wounds and the escape of the fluid were noted. There was paralysis of both lower extremities and of the lower half of the trunk. Complete anæsthesia with its highest level extended transversely around the body about two inches above the umbilicus. Between this level and the ninth rib there was incomplete anæsthesia, and from the upper boundary of this area to the second rib a transverse zone of hyperæthesia existed. This is most marked in the parasternal and mid-axillary lines (Fig. 2). There was complete retention of urine and

feces, accompanied by incomplete priapism, but no emissions. The deep reflexes were all absent. The cutaneous, viz., plantar, cremasteric, gluteal, and abdominal, were all faint on the left side, absent on the right. This is easily explained by the fact that, as was ascertained during the operation, the cord had not been completely destroyed on the left side. The pupils were dilated and mobile; the pulse was 90, full and soft; temperature normal; there was no evidence of shock or of hemorrhage.

In the hope of relieving any bony compression, and at his own request that some effort should be made, the patient was anæsthetized, chloroform being employed, and then placed in an almost full prone position, his thorax resting upon a pillow. An incision five inches long was made along the median line of the back with the bullet-wound as its centre, and carried down to the bones. The bullet was found to have passed beneath and splintered the left lamina of the fifth dorsal vertebra, penetrating the spinal canal at this point. The left lamina and spinous process were removed with a chisel and bone-forceps and the dura incised. There was no subdural hemorrhage, but fragments of bone and of clothing were removed. The spinal cord was found to be almost completely severed, a few fibres only of the left lateral columns remaining. Upon exploration of the wound the bullet (38-calibre) was found imbedded in the body of this vertebra a little to the right of the median line, and removed. The wound was irrigated with warm sterilized water, the dura sutured with fine catgut; deep muscular and superficial cutaneous silk sutures, with an iodoform gauze drain, were inserted. The patient left the table in excellent condition and was placed upon a water-bed.

There was but little change in his symptoms during the twenty-seven days in which he remained under observation. Considerable tympanites existed at intervals. Retention of urine, with the escape of a clear, glairy mucus from the meatus, and of feces, persisted throughout. The temperature ranged between 98° and 103°. There was no union of the wound, owing to the constant escape of cerebro-spinal fluid. No bed-sores developed during his stay in the hospital. Upon September 29th, twenty-seven days after the operation, he requested his discharge, and, as we learned subsequently, died at his home four days after leaving the hospital. He was perfectly rational up to the moment of death, and no change had occurred in his symptoms. A post-mortem examination made by Dr. Hektoen showed a fibrino-plastic meningitis above and below the seat of injury; a destruction of cord substance, with the exception of a few of the fibres of the left lateral columns for a distance of one and one-half inches at the fifth dorsal vertebra, acute cystitis and pyelo-nephritis.

The question may be asked why were either of these cases of gunshot wound operated upon when all symptoms indicated a complete destruction of the cord? In reply to this, as eminent an authority as Gowers may be quoted. He states that in such cases the cord suffers more often from displaced fragments of bone than from the ball itself. A bullet may strike the spinal column and cause immediate paraplegia as complete as if the cord had been divided, and yet it may be found that the cord itself is not at all injured; all this resulting from mere con-

cussion. Hence it seems perfectly justifiable to explore the wound thoroughly by means of an aseptic lamnectomy, which, as is shown in both cases, did not shorten the duration of life, but probably by the relief of inflammatory or other pressure actually prolonged it. The second case is especially interesting,

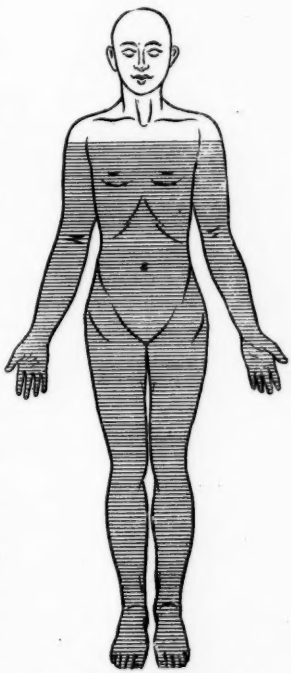
1st. Because the escape of cerebro-spinal fluid afforded positive evidence of entrance into the spinal canal.

2d. Because of the only partial loss of reflexes upon the left side, the cord not having been severed completely on this side at the seat of injury.

3d. That operation under antiseptic precautions is perfectly justifiable as giving the surgeon the opportunity of excluding bony compression, and is not merely a meddlesome interference to remove a probably septic bullet.

4th. That suture of the spinal cord is still impossible.

Fig. 3.



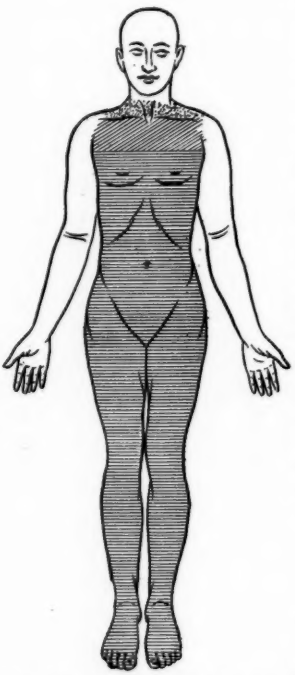
Case III. Anæsthesia shown in lines.

Case III. *Fracture of fifth and sixth cervical vertebræ; complete paralysis of limbs and trunk; lamnectomy twenty hours after injury; death eight hours after operation.*—C. H., aged twenty-nine, was admitted June 25, 1891, deeply intoxicated, in a semi-comatose condition, pupils dilated, breath smelling strongly of alcohol. He was asked to sit up, but on account of the intoxicated condition his non-compliance was unobserved. He was sent to a ward to "sober up." He had been found by the police lying on the sidewalk, and was unable to answer any questions or to respond to any form of stimulation or even severe supraorbital pressure. A few hours after, when he became more rational, an examination revealed a complete paralysis of both upper and lower limbs and of thoracic and abdominal muscles. Respiration was jerky, diaphragmatic, anæsthesia extended as high as the upper border of the third rib in front, and the fifth dorsal spine behind. Its highest level on the arms was a projection of the line of the upper border of the third rib. (Fig. 3.) It was impossible to ascertain whether any hyperæsthetic area existed. Pupils were widely dilated. There was no evidence of the involvement of any of the cranial nerves. There was complete absence of both superficial and deep reflexes. There was turgidity of

the penis, but no erection or emission; retention of urine, but involuntary defecation. He was now able to state that he had fallen a distance of eight feet, striking upon his head. There was tenderness on pressure over the cervical region, with a depression opposite the spines of the fifth and sixth vertebræ. The temperature rose from 97.8° on admission to 104°, axilla, seventeen hours after the injury. The patient's condition being clearly hopeless otherwise, an exploratory lamnectomy was performed by Dr. Albert I. Bouffleur at 8 P. M., twenty hours after injury.

The head and back of the neck having been shaved and carefully prepared, an incision was made over the cervical spinous processes, having its centre opposite the fifth. The muscles and ligaments having been cleared from the arch, the spinous processes of the fifth and sixth were found freely movable and crepitating, the right laminæ of these vertebræ were removed with a chisel and rongeur forceps, thus exposing the spinal canal, from which considerable clotted and fluid extra-dural blood escaped. The dura presented a perfectly normal appearance. As nothing further could be done, the muscles were brought together by deep coarse silk sutures, and a large drainage-tube and superficial fine silk sutures inserted, and the patient placed upon a posterior splint padded in the cervical region. The pulse upon leaving the table was 120, small and soft; respiration very shallow and labored. The temperature rose to 106° axilla. He gradually became more cyanotic, and eight hours after the operation died apparently of respiratory failure. No post-mortem examination could be obtained.

FIG. 4.



Case IV. Showing complete anæsthesia in transverse lines, of partial anæsthesia in diagonal lines, and of hyperæsthesia in dots.

Whether in this case there was a fracture of the bodies of the fifth and sixth cervical vertebræ, or a dislocation existed which had been reduced by manipulation resulting in a temporary crush of the cord, it is impossible to state.

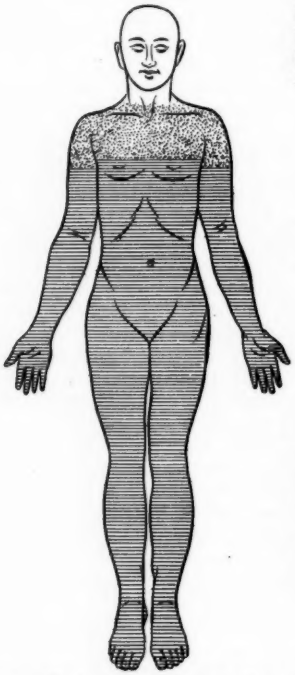
CASE IV. *Dislocation of second dorsal and first lumbar vertebræ; fracture of the twelfth dorsal vertebra; paralysis of lower limbs and trunk; lamnectomy sixty-two hours after injury; death fifteen hours after operation.* —G. T. was struck in the breast by a cable grip-car, and fell backward, being found in an unconscious condition. He was admitted to the ser-

vice of Dr. Jacob Frank about one hour after injury, and, in addition to the simple fracture of the sternum, there was a soft, fluctuating swelling corresponding to the normal position of the spine of the first lumbar vertebra, into which the finger could be pressed very deeply, indicating an absence of the spinous process. A deformity existed in the upper dorsal region caused by the projection backward of the spine of the second dorsal vertebra; crepitus and a false point of motion upon manipulation of the arch of the twelfth dorsal vertebra. Pulse was 90, full and soft, but soon became rapid and almost imperceptible. Respiration 24, diaphragmatic and shallow. The lower limb, abdominal and intercostal muscles were completely paralyzed, and anæsthesia extended as high as the upper border of the third rib. (Fig. 4.) From this highest level of anæsthesia to the clavicle there was incomplete anæsthesia, and extending an indefinite distance above this an area of hyperæsthesia. Reflexes, both superficial and deep, absent except the left cremasteric, which could easily be elicited upon stroking the left thigh. There was complete priapism and retention of the urine and feces. Sixty-two hours after injury an exploratory lamnectomy, with the hope of reducing the dislocations, was performed by Dr. A. E. Halstead. An incision was made over the first lumbar vertebra, and the swelling noted upon admission was found to be due to a large hæmatoma dissecting up all the muscles. The left lamina and spinous process of the twelfth dorsal vertebra were found fractured, and were removed. After the hæmatoma had been washed out with warm sterilized water a dislocation directly forward of the first lumbar vertebra, with a flexion of the cord, was noted. Extension was made on the lower limbs, followed by flexion of thighs on pelvis, and pelvis on trunk, and thus luxation fully reduced, and an attempt made to maintain it by fixation in this position with pillows and bandages. While this wound was being sutured an incision was made over the prominence in the upper dorsal region, and by fixation of thorax and extension of neck on trunk this dislocation was also reduced, but relapsed easily into the former position. Owing to the very low condition of the patient, it was deemed inadvisable to attempt to maintain permanent reduction by means of silver wires. The patient's condition became worse, respiration became more labored and rapid, temperature rose to 106° axilla, and death occurred fifteen hours after operation, the patient never having rallied from the shock. No post-mortem examination was held.

Case V. *Fracture of body and laminæ of fifth cervical vertebra; complete paralysis of limbs and trunk; death eight days after injury.*—J. A., aged thirty-five, was admitted to the service of Dr. Sanger Brown, November 8th. Brought by police ambulance, with a history of having been arrested on the previous evening while intoxicated and placed in a cell. Upon the morning of admission he was found lying upon the floor of the cell, and when asked to get up stated that he was unable to do so on account of the paralysis of both legs. The manner in which the accident occurred was not to be ascertained either from the patient or the police. Examination revealed severe pain referred to back of neck when the head was moved, and he said he felt better when the head was extended. A marked depression existed opposite the spine of the fourth cervical vertebra, and upon manipulation crepitus could be obtained. No irregularities could be felt on the pharyngeal side through the mouth. There was considerable tenderness when pressure was made

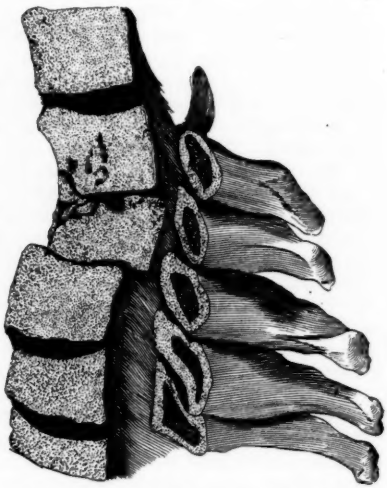
over the cervical region. Respiration was shallow and diaphragmatic; pulse 64, small and soft; temperature subnormal; pupils contracted and feebly mobile. There was complete paralysis of the lower limbs and of the abdominal and thoracic muscles. The position of the upper limbs was not noted at this time, but all the muscles, with the exception of the biceps, supinator longus, and deltoid, were paralyzed, so that when he was asked to move his arms he would flex the elbows, abduct the humerus, and supinate the hand in the order named. There was incomplete anæsthesia at the time of admission, the patient being able to localize tactile sensation on his lower limbs and abdomen fairly well. Only the patellar reflex was

Fig. 5.



Case V. Anæsthesia shown in lines, hyperæsthesia in dots.

Fig. 6.



Drawing made from post-mortem specimen (Case V.), showing fracture of body of fifth cervical vertebra, and its projection into the spinal canal.

observed, and this was found absent. Marked priapism without seminal emissions; retention of urine, and later involuntary evacuation of feces. Examination a few hours later showed complete anæsthesia of lower limbs and trunk up to fourth rib anteriorly, and to level of second dorsal spine behind, and on arms to conjunction of upper and middle thirds of arm in front, and to a little above elbow on the outer and posterior aspects. Above the upper level of the area of anæsthesia on both arm and trunk there was hyperæsthesia extending about two inches above the clavicle. (Fig. 5.) All the deep and superficial reflexes were absent, with the exception of the plantar, which was faint, and the cremasteric, almost imperceptible. There was complete paral-

ysis of both upper and lower extremities, the patient being able to use the posterior scapular muscles only. His arms were semiflexed, adducted, and pronated. Priapism had disappeared. Temperature had risen to 106.2° F., axilla.

November 11th, three days after the injury, the condition remained unchanged. There was complete retention of the urine and involuntary defecation. His temperature had fallen to 99°, axilla. He was placed upon a water-bed, the head of which was raised at an angle of 45°, and the portion used to support the head in the Sayre's suspension apparatus applied so that there would be a tension upon the fractured vertebra. During the manipulation in applying the extension the patient suddenly became cyanotic, and respiration ceased, but was restored upon extension of the head on the neck. No improvement followed the use of the extension. The patient gradually sank, and died November 16th, eight days after the injury. A post-mortem examination made by Dr. Ludvig Hektoen showed a fracture almost symmetrical of the laminæ, near the body of the fourth cervical vertebra. No subdural hemorrhage. As shown in the drawing (Fig. 6), there is a comminuted fracture of the upper half of the body of the fourth vertebra, causing a marked projection into and narrowing the lumen of the spinal canal, and producing an area of softening in the cord itself directly opposite the point of fracture. Sections showed the cord to be red, markings obliterated and very soft.

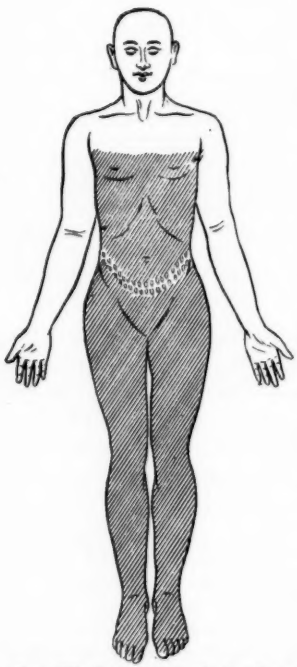
The post-mortem findings in this case lead to the conclusion that an early operation would have given the patient the best opportunity for recovery. The injury to the cord was at the level of the sixth cervical segment, and verifies, by the paralysis at first of all the muscles of the upper extremities excepting the biceps, supinator longus, and deltoid, the localization of the spinal centres for this segment, as laid down by Thorburn and others.

Case VI. *Sarcoma in substance of cord at level of fourth and fifth dorsal vertebræ; operation, enucleation; death on fifth day.*—The following absolutely unique case we are permitted to report by the kindness of Dr. Christian Fenger, of this city. The notes are mainly by Dr. Frank Billings, who saw the case in consultation and at the time of operation.

The history of the patient in brief is this: He was a native of Ireland, thirty-eight years of age, and lived in this State (Illinois). He had been treated at Freeport. His personal history was clouded by ignorance; he knew very little about his people and gave a remarkably obtuse history concerning himself. He seemed, however, to be free from hereditary taint of any kind. He was unable to give any exact dates concerning his present sickness; he stated that about one year ago he was seized one night with a severe pain in the lumbar region of the spine, so severe that a physician was called. This pain repeated itself for three nights; it disappeared, or at least diminished, during the day, so that he attended to his business, that of a saloon keeper. He said the pain did not disappear after that, but continued, although not so severe as during the first three days, until he came to Chicago. He described the pain as of a dull aching character, and situated directly in the spinal column about the lumbar vertebræ. No other symptoms

developed for three months; then he began to feel weak in his right lower extremity, and simultaneously with the development of that weakness he felt a constricting band about his abdomen midway between the umbilicus and pubes. About three months after the development of weakness in the right lower extremity the left lower extremity became affected and he became unable to walk. That was some time in January 1890. His bowels were not affected, although he suffered from constipation after taking to his bed; he was always able to void his urine voluntarily. He was brought to Chicago and placed in the Emergency Hospital in Dr. Fenger's care.

FIG. 7.



Case VI. Partial anæsthesia shown in diagonal lines, and girdle sensation in dots.

He was robust in appearance and well nourished; complained of the constricting band about the abdomen between the umbilicus and the pubes, and occasional lancinating pains extending down the lower extremities along the nerves in front and behind. He complained of the constipation that I have mentioned, and said he had been always able to void his water, but on examination I found the bladder distended to the umbilicus and drew off a full complement of urine. Examination of the man showed nothing abnormal above the diaphragm as far as the internal organs were concerned. His lungs and heart seemed to be in normal condition, and he had good strength in his arms and the muscles of his head and neck. Below the fourth rib (Fig. 7) there was almost entire absence of temperature sense, and greatly diminished tactile sensation; he could tell when anyone touched his skin, but that was all. There was paresis of the lower extremities, more of the left than of the right limb, but with marked increase of all the reflexes of the lower extremities; all superficial and deep reflexes were present everywhere. These were all the symptoms the man presented in addition to the band of constriction about his body midway between the umbilicus and pubes.

We arrived at a diagnosis of pressure myelitis from the fact of its developing so slowly, and from the fact that there were present an increase of all the reflexes in the body. Horsley and Gowers have laid down the rule that the tumor that presses on the cord is two inches above the pain, which, as you remember, in this case was on a level with the constricting band, midway between the umbilicus and the pubes, but, as there was anæsthesia as high as the fourth dorsal vertebra, which was hard to explain, it was decided that if an operation was performed

it should be at that point. The man consented to the operation, and on the 5th of June Dr. Fenger cut down upon the fourth dorsal spine, making an incision which laid bare the spinous processes of the third, fourth, and fifth dorsal vertebræ, and after cutting away the spines of those three and the laminæ of the fourth and fifth, no tumor could be found pressing upon the cord. Externally the membranes of the cord and the fat surrounding it looked normal—looked as if we had missed the diagnosis.

Having made an incision through the dura mater, the cord upon inspection looked normal, but upon passing the fingers over it there was a distinct enlargement of its posterior half, and a longitudinal incision along its posterior median line revealed a tumor nearly two inches long, conical at both extremities, largest in the middle. It was incised in the centre to remove it, and one-half used for microscopic examination by Dr. George S. Isham. It has been found to be a large spindle-celled sarcoma. The tumor was easily enucleated and seemingly without hemorrhage, and then the dura mater was almost closed, leaving slight capillary drainage, and the wound closed in an antiseptic manner. The man had complete paraplegia after the operation. For two days his temperature did not exceed 101°, ran from 99° to 101°, then rapidly developed to 103½°, and he died of septicæmia on the fifth day after the operation.

That portion of the cord involved in the operation was removed post-mortem, and was placed in Müller's fluid. The anterior two-thirds of the cord was intact, the gray matter seemingly was not compressed, the tumor lay in the posterior third of the cord and was covered with a thin layer of the white columns. The cause of the paraplegia that followed the operation was a hemorrhage in the cord just below the tumor, that was probably a post-operative hemorrhage, extending almost transversely through the cord. Before the cord was incised longitudinally to get at the tumor a softened spot could be felt just below the latter, and at that spot the hemorrhage occurred.

But for the septicæmia that developed it is possible that this man would have recovered, at least to a great extent, his power of motion; perhaps he would have had some anæsthesia from the laceration of the posterior part of the cord, but it seems possible that this operation might have relieved him. There was a purulent infiltration of the soft tissues all about the wound, and localized suppurative spinal meningitis. Why this occurred no one can say, as every care as to cleanliness was taken during the operation.

The girdle pain at the level of the last dorsal segment is not readily understood by the findings in this case, and as this portion of the cord was not investigated post-mortem, it must remain unexplained.

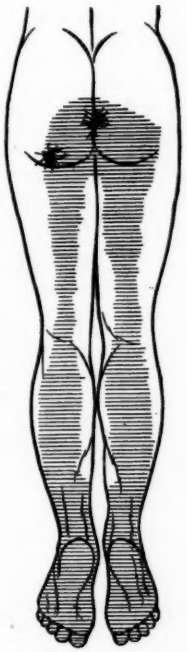
CASE VII. *Crushing injury of the cauda; operation after two years; some relief.*—We are under obligation to Dr. J. Frank, surgeon to the St. Elizabeth Hospital of this city, for the privilege of reporting this case, which has been carefully watched for two years by one of us.

J. M., a Polish boy aged nineteen years, of good habits, presenting a personal and family history free from notable peculiarities, a carpenter by trade; on the 18th of July, 1888, fell from a roof upon which he was working, to the ground, a distance of thirty-six feet. Ten feet from the ground he came in contact with another building, striking his back, finally alighting upon his feet and then falling unconscious, and so remained until carried a short distance into the street. From the very first there was complete loss of power in the lower extremities and much pain throughout the entire length of the back. The feet were numb and without sensation, but a darting pain in the legs persisted for weeks, gradually passing away. There was also more or less anæsthesia as high as the groins. Over the sacrum was an extensive ecchymosis which rapidly went on to the formation of a large slough within the first three days. The extremities rapidly swelled greatly, and this lasted for a week. After three days, no water having been passed, he was catheterized by the physician in charge of the case, and it was noted that the penis and scrotum were absolutely anæsthetic. When the bowels moved upon the exhibition of a cathartic the patient could not feel anything passing from the anus. Catheterization was required for a fortnight, when incontinence followed, the urine constantly dribbling away in both the recumbent and erect positions, and it is only during the past year that he has been able to retain his water for about three hours at a time. The bowels moved often without his knowledge, so that he unconsciously soiled his bed or trousers. Afterward by going to stool at regular intervals he managed to keep himself clean, but never experienced any sensation from the passing feces. The paralysis in the limbs, which seems never to have been complete, gradually improved. He sat up after the first month, but was confined to a chair when not lying down, for six months. Then he commenced to get about by pushing a chair before him. During the past four or five months he has been able to walk about his room and for short distances in a feeble and uncertain manner. Since the accident there has never been an erection of the penis or a seminal emission. Other organic functions have been properly performed, and his physical health has never been seriously undermined or even temporarily notably affected. Previous to his admission to the St. Elizabeth Hospital, under the care of Dr. Frank, he has been in the hands of numerous physicians, and spent some months in the Alexian Brothers' Hospital in this city. The slough over the sacrum never properly healed, and a fistulous tract formed leading to the sacro-coccygeal joint, with a dense cicatrical and extensive opening in the middle line. About five months ago a second similar opening formed in the lower and inner aspect of the left gluteal region. These have been painless, and the patient has also noticed that he could not feel the floor with his feet or the chair upon which he was sitting, and that the back of his thighs and legs were insensible to wind blowing upon them, or to pinching, or any form of sensory impression.

March 20, 1890, he presents the following condition: His attitude is uncertain, and he can only stand with his feet well separated. When he walks the pelvis oscillates, and the femora wabble around in their sockets as the weight of the body falls upon them. There is weakness in all the movements of the lower extremities, but particularly in the rotation of the thighs. Over an area embracing exactly and only the cutaneous distribution of the four lower sacral nerves, in

the territory supplied by the pudic, small sciatic, external saphenous, musculo-cutaneous, anterior tibial, and posterior tibial nerves, there is complete anæsthesia for tactile, pressure, thermic, electric, and painful impressions, all of which are, as nearly as can be determined by repeated tests, coextensively abolished. This area is shown in the darkened outline made from a photograph of the patient after the anæsthetic region had been marked out with nitrate of silver. (Figs. 8 and 9.) The

FIG. 8.



Case VII. Showing area of anæsthesia and fistulous openings.

FIG. 9.

Case VII. Showing anæsthesia.

cutaneous extent supplied by the lumbo-sacral cord and first sacral nerve are absolutely free from sensory disturbance.

All the muscles of the lower extremities react to both electric currents, with no changes in the order of response to the galvanic stimulus, but the muscles of the feet, including the calf muscles, respond feebly. Unfortunately, the rotators of the femur, which are supplied by branches from those sacral nerves which show implication in their cutaneous distribution, are so deeply situated that they cannot be electrically examined, but their paresis is shown in the characteristic gait and the weakness of inversion and eversion of the foot.

The lower portions of the glutei maximi seem wasted, and the trochanters are, perhaps, unduly uncovered and prominent.

The knee-jerk is almost abolished, while the plantar and gluteal reflexes are entirely absent. The cremasteric is active, and reflexes above this level are present.

The anus is patulous. The introduced finger encounters no sphincteric resistance whatever, and the patient cannot feel it in the slightest degree, even when deeply and forcibly inserted. The rectum is empty, as is the bladder. The prostate and seminal vesicles can be readily made out. There is great mobility of the coccyx, and grating at its articulation with the sacrum, but the latter bone does not present any abnormality to the investigating finger on its concavity, even as high as the promontory.

FIG. 10.

Case VII. Showing diminished area of anæsthesia after operation.

A diagnosis of injury to roots of lower four sacral nerves was made by Dr. Church, in which Dr. Sanger Brown, who kindly saw the patient, concurred, and an exploratory operation was advised in the hope that some pressure might be relieved, or, possibly, nerve suture be employed, and, at the same time, to close the ulcerating openings and rectify the diseased condition of the sacro-coccygeal joint.

September 26, 1890, under ether, by a median incision the spines of the sacrum were uncovered by Dr. Frank, and the fistulous opening over the coccyx included. This bone, or a small carious portion of it, was dissected out. The sacrum seemed strangely distorted, presenting about its middle a loss posteriorly, and when this was invaded with chisel and mallet no neural canal could be found. It was as if the bone had been crushed, impacted, and hypertrophied. At the lower level of the first sacral vertebra the spinal canal was found and the crushed-off termination of the dural sheath and cauda equina. The nerve roots of the cauda extending below this level were completely destroyed, or, at least, no trace of them could be found. Hemorrhage from the bone and soft parts was everywhere profuse, requiring much time for its control, and the portion of the bone removed showed inflammatory changes and infiltration. A fragment of the sacrum, probably including its two lowest segments, was found loose and came away, giving high access to the posterior wall of the rectum. The fistulous opening in the left buttock was also widely opened, and a saccular lining full of cheesy material dissected out. The cicatricial margins of both openings were trimmed away, and the parts closed with deep sutures.

October 19*th*. There is great improvement in sensation. About the toes it is blunted to some extent, but not absolutely; everywhere else it is normally acute, excepting in the gluteal region and the upper back

portion of the thighs, the perineum, scrotum, and under portion of penis. (See Fig. 10.) The penile meatus and anterior urethra are comparatively insensitive, but the anus responds to pricking, has some muscular sphincteric control, and motions are felt when he goes to stool. Movements in the right lower extremity are well performed, but below the knee on the left side there is complete motor paralysis, probably due to the breaking of a nerve-cord at the time of operation. Since the operation there has been much loss of weight, and the same atrophy in the gluteal region and throughout the lower extremities is present. The wound over the sacrum healed completely by first intention. The one over the left ischial tuberosity gapes widely, but is granulating freely, and seems disposed to heal. The peculiar saccular condition before noted is still present.

November 9th. Anæsthesia practically the same. Left leg and foot paralyzed for all motions, excepting the slightest lateral motion of foot at ankle-joint. Has had several erections. No ejaculations. More security in the hip-joints; gaining physically. Opening over left tuber ischii shows no tendency to close. Is receiving some electrical treatment of indifferent sort.

Four months after operation he left the hospital, with no improvement in gait, and power in left limb less than upon admission, but sensation much improved by the notable lessening of the anæsthetic area, and by the restored sensation and control of rectum and anus.

It is difficult to understand why there should have been a gain in sensation following the operation for the complete division of the cauda; and disappearance of all nerve structures below the first sacral vertebra did not permit us to hope for any repair or restoration of function.

CASE VIII. *Fracture of tenth and eleventh dorsal vertebræ, with dislocations between them; compression of cord; extra-dural hemorrhage; operation; excellent recovery.*—J. K., aged thirty-one years, teamster, German, about 10 A.M., on the 11th of March, 1891, was riding on a load of bricks, and while driving under a low shed was struck just below the nape of the neck while his body was in an extremely stooped position. As the wagon proceeded the ends of his vertebral column were brought nearer to each other than the anatomical continuity would permit, and, consequently, he sustained a fracture and dislocation of the vertebræ. He felt "something break," and after the wagon had cleared the shed he was found lying flat on his back on top of the load. He tried to get up, but found that he could not elevate his trunk or move his legs at all. In answer to his cries, friends came to his assistance, and lifted him from the wagon and tried to stand him up, but his legs would not support him; then they tried to sit him up in a chair; but the slightest relaxation of their support caused him "terrible pain," as he put it. He was admitted to the Cook County Hospital the same day, in the service of Dr. A. I. Bouffleur, who permits us to report the case.

Examination. An immense swelling over the whole dorsal region was noted, also a marked deformity of the back. It was found that there was a marked prominence about the eleventh vertebra, and an equally marked depression just above it. The immense diffuse swelling was soft and semi-fluctuating, being caused by extensive extravasation of blood

throughout the subcutaneous tissues. Palpation at the point of injury caused severe pain. The blood-clot beneath the skin was so extensive and thick that it was impossible to determine positively the presence of crepitus, though at times we thought we could detect it. There was complete motor paralysis below the umbilicus, including paralysis of the bladder and rectum, with hyperæsthesia of the corresponding surface. There was no reason to doubt that we had compression of the cord. Reduction by extension and counter-extension was very cautiously attempted, and, as there was a probability of an accompanying hemorrhage about the cord, an operation seemed the only rational and scientific procedure. There had been no improvement whatever in the five hours following the accident. The patient readily consented to an operation, which was performed about seven hours after the accident, with the valuable assistance of Drs. Bush, Piper, Gehrmann, and Keyes.

Chloroform was administered with the patient in a semi-prone position. An incision five inches long was made in the median line. After cutting through the superficial fascia, which was distended to the thickness of about one and one-half inches by extravasated blood, we found that the muscles of that region, the vertebral aponeurosis and all the inter-vertebral ligaments, had been ruptured transversely—in fact, broken. The tenth vertebra was found dislocated forward upon the eleventh, the laminæ of the tenth resting on the body of the eleventh, with the flattened cord between. Fractures of the articular processes, fragments of which were removed, were found. The introduction of the finger down to the cord determined the fact that the spinal canal was filled with a firm, extra-dural blood-clot, which was easily broken down. Considerable hemorrhage followed the withdrawal of the finger. Irrigation with quite warm sterilized water served the double purpose of washing out the clots and stopping the hemorrhage.

The anterior and posterior longitudinal spinal veins, the former of which are, normally, nearly the size of a crow's quill, had been severed. The interval between the transverse processes of the two vertebræ easily admitted the finger, which detected a large blood-clot anterior to the bodies of the vertebræ in the posterior mediastinal space. It was removed by irrigation. All hemorrhage having been controlled, reduction was effected by following the rule which the late Professor Gunn offered concerning reduction of dislocations of the hip, and which is quite as applicable in all dislocations as in those of the enarthrodial joints, viz.: "First place the parts, as nearly as possible, in the position in which they were at the time of escape; and second, reverse the force." This was followed as much as possible, by first flexing the trunk, and secondly making extension and counter-extension from the shoulders and legs, and local elevation of the upper segment, with depression of the lower. The vertebræ were thus brought into position, but the articular processes would not approximate properly, and on slight motion of the body would slip past each other. To maintain the parts in proper position the two spinous processes were connected by means of a very large silk ligature, inserted through drill perforations of the upper part of the tenth and lower part of the eleventh near the laminæ. By this means we were enabled to completely reduce and maintain the segments in proper coaptation.

The torn ends of the muscles were then accurately coapted by means of silk, tube drainage employed, the wound dressed, and a plaster-of-

Paris cast applied. The patient remained in a prone position, with upper part of chest and shoulders somewhat elevated, until the cast had dried.

There was nothing particularly irregular in the history of the case during the stage of wound-healing and complete repair. He had involuntary bowel movements for two days and had to be catheterized for a similar length of time.

During the second twenty-four hours had a temperature varying from 90° to 101.2°, with rapid and labored respirations, 32 to 36 per minute. He felt very well, however, and took abundant nourishment. We considered the symptoms as indicating only fermentation fever, and as the kidneys were secreting an abundance of urine we did not think any medication necessary.

On the morning of the 13th, forty hours after the operation, voluntary use of the gluteal muscles was present to a slight degree. Twelve hours later he could rotate the limbs quite freely and could adduct them about eight inches each.

March 14. No bowel movements. Could urinate voluntarily. Morning temperature normal; evening, 101.2°. Respiration 20 to 24.

16*th*. Began to have voluntary bowel movements. Motion manifest in the flexors of the toe. As there had been a little rise of temperature for thirty-six hours (99° to 101.2°) it was deemed advisable to dress the wound. A fenestra was cut over the site of the operation. The dressings were found saturated with a reddish-colored fluid. No odor of decomposition. Ends of tubes occluded with blood-clots; no evidence of blood-clots deep in the tubes or wound. Irrigation with sterilized water and new dressings applied.

The bowel movements having soiled the cast, it was removed on the 20th. Wound perfectly clean and union by "primary intention." Drainage tubes removed and new cast applied. There being no rise of temperature or other unfavorable symptom, the cast was allowed to remain on four weeks.

Five and one-half weeks after accident, cicatrix found to be firm. No discharge, and only small bunch of exuberant granulations over drainage holes. These were removed, and surfaces healed within a week. During this week he remained in bed without a cast. About May 1st a cast was applied, and he was allowed to be around in a wheel chair, and then with crutches, which he continues to carry merely as a means of safety to prevent any mishap. The last cast was removed about the middle of June, and the patient has practically every control of his lower extremities.

As "the proof of the pudding is in the eating," so the proof of the justifiability of an operation is in the pathological conditions found and the success of the efforts for their removal. In this case we encountered three important pathologico-etiological conditions which we were able to remove. First, small fragments of bone, which, as before stated, might cause a fatal inflammatory process; second, extra-dural extravasation of blood. Hutchinson states that "he has never seen it to the extent of possible compression," but Oldknow, Stephen Smith, Jones, and Willett have reported cases in which extravasation of blood was the cause of

compression. In this case the spinal canal and the surrounding parts were filled with firm blood-clots, and it is not believed that reduction simply would have relieved all the compression. As a result of operating we were able to effect a complete reduction of the articular processes as well as of the bodies of the vertebræ, and to employ efficient means for the maintenance of the reduction, and also to make an anatomical coaptation of the divided muscles, etc., all of which, of necessity, add to the appearance, strength, and usefulness of the spine.

June 20th the patient was exhibited to the Chicago Medical Society, and was able to walk with tolerable firmness. The back showed no deformity or limitation of flexibility, and the result seemed most excellent. At this date, November, 1891, the condition is still most favorable.

In all these cases it will be noted that the only uniform and constant symptom of value in localizing the injury to the cord was the area of perverted sensibility and especially its upper limit, and further, that this limit in the upper thorax, as a rule, is transverse rather than in the line of the ribs.

ECHINOCOCCUS MULTILOCULARIS OF THE BRAIN.

By Henry H. Mudd, M.D.,
ST. LOUIS, MO.

Swelling over right Rolandic region; hemiparesis, with tremor; left-sided hemianopsia; choked disk; removal of an echinococcus cyst; hernia cerebri accompanied by high temperature; disappearance of both by pressure; complete recovery.

D. A., an unusually large and well-developed girl, aged twelve years, presented herself, in March, 1891, for treatment. At my request she entered St. Luke's Hospital. Her parents stated that she had always been a robust, strong-willed, and somewhat irascible child. The first evidence of her present trouble was a severe, diffuse headache, which commenced in the latter part of July, 1890. This continued for several weeks. The child would frequently stop playing, lie down until the pain was easier, and then get up to resume her play. She was not confined to bed an entire day during the continuance of the headache.

In the first week of October a small elevation of bone, about the size of a silver quarter, was observed above the right ear. The headache disappeared before the tumor was noticed. The swelling by firm pressure could be indented. On ceasing pressure it returned to its place with a snap, like thick, elastic paper or the bottom of a tin pan when pressure is alternately made and released.

Before this swelling appeared the left hand and arm twitched and trembled. The parents stated that the tremor was confined at first to the hand. Soon after this tremor was noticed the mouth during laughter

was drawn to the right side. Later both the head and leg began to twitch and tremble. Thus, according to the history, the twitching commenced in the hand, became diffuse, involving the entire left side, the face, head, neck, and leg becoming implicated. The mother asserts that the walk is better now than it was during the early winter, the twitching in the leg being also much less.

Present condition (March 14, 1891): The child has quick perception and good reasoning powers. There is an active twitching of the left side of the body. This tremor is rarely noticed in the facial muscles, but is pronounced in the platysma and the neck. The head is turned slightly to the right. The left angle of the mouth is depressed. The facial muscles on that side are sluggish and feeble. The impairment is not as marked in the upper part of the face as in the lower. The case is one of well-marked hemiparesis of cerebral origin complicated with tremor.

The pupils respond readily to light, and accommodation is good. There is left-sided homonymous hemianopsia. Smell and hearing, so far as determined, are normal. There is no gastric disturbance; no vertigo and no headache since August. She complains occasionally of the left side being cold.

There is an oval swelling above the right ear. The central point is elevated fully one-half an inch above the level of the skull. The scalp is normal, and is not infiltrated or inflamed over the protuberant area. A horizontal line around the skull a little above the external angular process passes over the tumor, and the right half of this line is three-quarters of an inch longer than the left. The base of this swelling measures in vertical diameter three-quarters of an inch (two cm.) and its horizontal diameter two inches (five cm.). The apex of the swelling is two and one-half inches above the external auditory meatus.

The motor area first involved by the growth was evidently the centre for the wrist and fingers in the middle third of the ascending parietal convolution. The size of the tumor, the amount of brain-tissue displaced, and the pressure established, implicated the entire left side in loss of motor power. The tumor could be seen and felt. Cerebral localization was unnecessary.

I extract from a report made by Dr. Frank Fry, who carefully examined the child: "Patient has a left hemiplegia; face and neck (slightly) and upper and lower extremities are involved. Eye is slightly affected; the lower part of the face much more. Tongue protrudes straight. She can extend the left hand (wrist) to right line. Relative grip of two hands by dynamometer is: right, 60; left, 40. Has a hemiplegic gait, foot being circumducted and the toe scraping slightly in walking. Can flex the foot (ankle) slightly. There is a slight talipes varus. Measurements of extremities are as follows:

"*Arm:* Dext., 4 inches above external condyle of humerus, 9½ inches; sin., 4 inches above external condyle of humerus, 9¼ inches.

"*Forearm:* Dext., 4 inches above styloid process of ulna, 8 inches; sin., 4 inches above styloid process of ulna, 7¾ inches.

"*Leg:* Dext., 4 inches below head of fibula, 12¼ inches; sin., 4 inches below head of fibula, 12¼ inches.

"The muscles of the neck, of the upper and lower extremities, are in a condition of rhythmic spasm and tremor. This is only slight in the neck, greater in the leg and thigh, and greatest in the arm, forearm, and shoulder (in order named). The spasm is increased by voluntary

movement; greatly so in the upper extremity. Knee-jerk slightly increased on the left."

Dr. J. B. Shapleigh, examining the ears, reports them almost normal, and says that "there is no evidence that the function of the auditory nerve is at all interfered with by the cerebral trouble."

Dr. M. H. Post found "optic neuritis, the swelling of each disk amounting to four dioptrics. Also, a loss of vision in the left half of each field (homonymous hemianopsia) corresponding to the right half of each retina to the vertical median line. Nothing in the condition of media or fundus of either eye to account for this defect. (Before the operation vision in right eye $= \frac{14}{XVI}$, some hesitancy, and in the left eye $= \frac{14}{XVI}$, prompt and accurate.) Pupils react well both to light and accommodation.

Ten days after the operation, vision in right eye $= \frac{14}{XII^{1/2}}$, and in the left eye $= \frac{14}{XII^{1/2}}$. Condition of each fundus as at first examined, and hemianopsia still present.

The anatomico-pathological diagnosis was uncertain, but we suspected a sarcoma. The temperature on the day before the operation was 100.4°, though she appeared well in other respects.

Operation. The patient having been properly prepared—antiseptic precautions being taken—the operation was performed March 20, 1891. A large, oval flap of the scalp and periosteum, with its base above the ear, was reflected from the skull. The bone was incised by a chisel, and an oval flap outlined with the bone-pliers. This flap was turned downward; the bone was thin and pliable and did not break. The periosteum was closely adherent to the elevated area. The dura was attached to the bone, but was loosened; it was evident that a fluid separated it from the brain. There was no pulsation perceptible either to sight or touch. The dura was incised, and a clear, watery fluid escaped. The opening was enlarged, and a collapsed cyst was lifted from the opening. Many cysts of varying sizes were removed, with their contents. Finally, a translucent membrane was exposed at the deepest part of the depression in the brain; it looked like another cyst, and was purposely punctured. It was probably the ependyma ventriculi, for the lateral ventricle was opened and drained; the flow of serum was free, and continued seventeen days.

The excavation in the brain left by the removal of the cysts was cleared of the fragments of the cysts-walls by a blunt curette used as a scoop. The brain was not bruised. This deep excavation, as large as a hen's egg, retained its outline. The cavity of the lateral ventricle being dilated was well exposed. The outlines of the convolutions were obscured; but, as nearly as I could determine, the temporo-sphenoidal convolutions were pushed downward and backward. The cavity occupied the greater part of the lower two-thirds of the Rolandic region.

A gauze drain was left in the opening in the dura and carried out through the bone and the scalp. The bone-flap was put into position, and the scalp sutured in place. The abundant antiseptic dressings put

over the wound were held by a roller bandage which exerted moderate pressure.

The patient bore the operation well. There was no apparent disturbance from the escape of the cerebro-spinal fluid.

There was no evidence of inflammation of the parts involved, except in the adhesion of the dura mater and pericranium to the thin and distended parietal bone.

Notes from Case Record. March 20, operation at 1 P.M. Present: Drs. Gregory (senior and junior), Dr. N. B. Carson, Dr. Frank Fry, Dr. L. Bremer, Dr. E. F. Smith, Dr. Harry Hodgen, and Dr. Harvey Mudd.

20*th* (five hours after operation). Dressing is saturated with moisture. Left foot and heel itching. Less motion in arm. Sweating.

21*st*. Arm quiet, except as muscular effort brings twitching. Tent removed. Pulsation evident over the site of the protuberance.

23*d*. Vomited several times to-day.

24*th*. Can move arm without tremor.

25*th*. Moves arm without tremor.

April 4. Twitching of arm more marked during last day or two. Serous discharge has been less.

7*th*. Dressings dry. There has been a diminishing discharge of serum. Has been no suppuration. A soft swelling appeared at the site of opening in the skull two or three days after the operation. It is now quite marked, more tense, and pulsates.

20*th*. Arm twitches even when patient is quiet.

21*st*. Arm twitches almost constantly.

24*th*. Right side of face and scalp much swollen.

25*th*. Wound was reopened. The mass proved to be a hernia cerebri protruding through the opening in the skull. The hernia was explored with the aspirator. No fluid was obtained, and no evidence of a redevelopment of the cystic growth was discovered. The scalp was again sutured and the wound entirely closed after freshening the edges. Firm pressure was put upon the hernia. This exploratory operation did not disturb the patient. The wound healed perfectly in a few days. The firm pressure put upon the hernia soon controlled it, and the patient's general condition rapidly improved. The hernia had a base of nearly two inches diameter and an elevation of at least an inch.

30*th*. Patient for first time wants to get out of bed. Walked about the room.

May 1. Patient is hungry all the time.

7*th*. Discharged from the hospital.

The surface temperature of the body and extremities was not taken. The temperature for a few days before the operation was recorded. Only once was it observed to rise above 100°; this was on the day before the operation. On the day of the operation the morning temperature was 99°; at 9 P.M. it was 102.4°. Most of the time for the succeeding thirty-five days it fluctuated between 100° and 103°. The changes were at times rapid and always uncertain. On the twenty-second day, for the first time, a normal temperature was recorded, but on the same day it reached 105.4°. This fever did not appear to distress the child; the tongue remained clean, the appetite good, and the loss of flesh was not great. The child slept much, but was bright, though irritable when

disturbed, and she had no desire to get up. Pupils reacted well, and were rather large.

The swelling at the site of tumor reappeared after the first operation before the primary dressing was removed; it pulsated, and was soft; it increased in size, and at points the scalp appeared thin, and fluctuation was evident; I punctured at different points, and serum escaped freely; drainage from under the scalp and from these punctures did not cease until the seventeenth day. I feared the fever was due to pressure from a serous exudate from the ventricles or to an inflammatory process, though no other evidence of wound disturbance was present. Hence, the support given to the hernial protrusion was insufficient and more or less intermittent. The patient was irritable, and complained bitterly of a tight bandage. On the thirty-fifth day, with a temperature of 102.8°, the scalp was lifted from the skull and the tumor sufficiently exposed to reveal its true character as a hernia of the brain. The aspirator was used at several different points with a negative result. Being now satisfied of the condition, a pad, with firm pressure from a bandage, was applied. The temperature promptly subsided, and the next day reached 99°. Thereafter it was normal, and the patient was discharged well eleven days later, or May 6, 1891.

The prompt disappearance of the fever was evidently due to the pressure and control of the hernia cerebri. It is now evident to me that prompt and efficient pressure would have hastened the recovery of my patient. It is probable that irritation of the motor area and the corpus striatum determined the abnormal heat.

Etiology of tumor. The patient lived in the country, and had for a playmate a shepherd dog with which she spent much of her time. The dog was killed in 1889, so that the infection of the patient, if from this source, must have occurred at least one and one-half years before the operation. But it was only eight months from the initial symptom to the date of the operation. It is possible that some of the larvæ may still remain as a focus for a redevelopment of this parasitic cyst.

The prognosis is, however, good, as other cysts of the same character have been cured simply by aspiration.

A considerable quantity of the fluid from the cysts was lost, but the portion saved, together with all of the cyst-walls, was given to Dr. Ludwig Bremer for examination. The specimen removed and some microscopic slides were presented for inspection.

Dr. Bremer's report, together with remarks on the neurological aspect of the case, he has kindly added to this history.

September 16, 1891. The patient presented herself for examination to-day. She has worn a truss over the defect in the skull up to the present time. There is no disposition to protrusion of the brain, and the place of operation is marked by a slight depression. The thin flap of bone which was preserved and turned back is still perceptible to the touch in its original size. The pulsation of the brain can be felt at the

upper crescent of the defect through the integument whenever the head is in a dependent position.

The paralysis and irritative disturbances have disappeared. Her gait is perfect; she is able to hop on the formerly affected (left) leg. Uses her left hand with ease and strength. Facial expression is natural. No trace of tremor. Reflexes normal.

Dr. Post, after a final examination, reports that the optic neuritis has disappeared; bloodvessels still a little enlarged. The hemianopsia is disappearing, the field of vision being nearly normal.

This complete recovery from the effects of a defect of such size as that described above is, perhaps, without a parallel in cerebral surgery. If we consider that a prolapse of the brain of such magnitude always means more or less necrosis, and occurring in a highly differentiated region of the brain, as this did, it is certainly remarkable that a complete restoration to perfect health should have taken place as evidenced by the absolutely normal condition of the organs affected by the morbid process.

LITERATURE (BY DR. BREMER).—Hydatids of the brain are comparatively rare. T. S. Cobbold (*Parasites of Man and Animals*) found that among 327 cases of hydatids known in literature, 22 occurred in the brain. The organ of predilection for the parasite is the liver.

Up to the year 1883, 19 cases of echinococcus of the brain had been registered by A. Steffins as post-mortem findings. Since then about 9 others have been reported, 3 of which are not based on autopsies only, but gave cause for operative interference. Of these, as will be seen, only 1 recovered.

Dr. A. Castro,[1] of Buenos Ayres, trephined a boy of fourteen, with localizing symptoms, over the Rolandic region, for a progressive atrophy and paralysis of both extremities of the right side; pain on left side of the head. Two cysts were found—one the size of a walnut, the other that of a hen's egg. The patient died from basilar (?) meningitis.

Another case was operated on by J. C. Verco.[2] The patient was a boy of eleven years. At first, pain in right temporal region; later on, protrusion of bone. Choked disk, mydriasis, attacks of unconsciousness, with spasms in the left arm. The patient was already much reduced in strength when consent to operation was given.

After the cyst had been removed a very large cavity remained. The wall of the cyst was formed by a thin layer of brain substance. The child died from purulent meningitis, which probably had existed before the operation.

The third[3]—and, previously to the one under discussion, the only case recovered after operation—is reported in the *Australian Medical Journal* for July, 1890. Dr. Graham and Mr. Grubbe diagnosticated, in a boy of

[1] Jahrb. für Kinderheilk., Bd. xx, Heft 1.

[2] Annales del Círculo Medico Argentino, October, 1889.

[3] "Hydatid of the Brain; Removal by Operation; Death after Four Days." Intercolonial Medical Congress of Australasia: Transactions of Second Session, held in Melbourne, Victoria, January, 1889. (After Neurolog. Centralbl., 1889, p. 443.)

sixteen years, presenting the symptoms of headache, nausea, vertigo, vomiting, loss of memory, mental dulness, and paresis of the right arm, a tumor in the left motor area.

The bone when removed was only one-sixteenth of an inch thick, and a cyst four inches long was found upon the pia mater, and removed. The brain itself was not involved; the boy recovered and remained well, except for his blindness.

Point of Colonization and Development of the Parasite in Dr. Mudd's Case.

The starting-point of the parasitic growth was most probably on the convexity of the brain, over the centre for the wrist and fingers, in the subarachnoidal space. Since the sac extended through the whole of the centrum ovale into the lateral ventricle, it might be assumed that possibly it developed from the latter, and thence grew and spread toward the convexity, for the ventricles form a seat of predilection for echinococcus of the brain; next comes the subarachnoid space. But the intra-ventricular origin of the growth is rendered improbable by the clinical course of the case.

Localized irritative symptoms (twitching of the hand) manifested themselves first, pointing to a circumscribed area of the cortex; with the encroachment of the increasing tumor upon the subjacent conducting fibres paralytic symptoms set in. Again, the shape of the defect speaks in favor of a development from the periphery to the mesial plane. The shape of the sac, as outlined by the hole in the brain, was that of an egg—oval in the strict sense of the word—the apex being toward the ventricle, the base toward the convexity. Thus, for simple morphological reasons, the subarachnoidal origin of the tumor seems to be the more probable one. Growing from the periphery it pushed its way toward the centre. Whereas, during the first period of its development, there was an effort on the part of the tumor to corrode and discharge through the skull-bone, this outward march was checked for some unaccountable reason, after the inner table and the diploë had been destroyed and the outer table had been reduced to a thin lamina not much thicker than an eggshell.

Definition and Causation of the Clinical Features.

It might appear singular that a tumor larger than a large-sized hen's egg should produce no graver symptoms than it did, and that the hand and arm should be found only in a state of paresis, when the region of the arm and hand centres, and apparently their conducting fibres, were occupied by a foreign mass. Another question is the nature of the irritative symptom—the tremor.

The first peculiarity, the partial paralysis, seems to be explicable on

the following grounds: The tumor grew very slowly; it did not involve the brain directly, but, with its pointed extremity directed in the axis of its growth, it pushed the fibres of the brain substance asunder, compressing rather than destroying them. Supposing even that the cortical centres for the fingers, hand, and arm were destroyed, the slow growth of the parasite gave the surrounding cortical areas a chance to vicariously[1] assume the functions, at least partially, of the destroyed centres. As to the conducting fibres of the corona radiata, they were, no doubt, atrophied by pressure to some extent, but enough remained to carry on the conduction. The general involvement of the whole left side of the body did not depend so much on a cortical destruction as on that of the conducting fibres. The apex of the tumor struck them at a point of convergence, where they unite to form the internal capsule.

It is on this ground, too, that the irritative symptom—the tremor—has to be explained. This tremor partook very much of the nature of the kind met with in cerebro-spinal sclerosis. The anatomico-pathological substratum of this affection is the sclerotic patches in the pyramidal tract of the brain (centrum ovale) and spinal cord. The interruption, or, at all events, the impairment, of conduction in the converging motor fibres must, in this case, too, be looked upon as the cause of the tremor. Like that observed in sclerosis, it was an intention tremor, increasing in proportion with the efforts at movement.

It may not be amiss to state here that the case reminded one somewhat of chorea electrica.

Eye symptoms. Besides the choked disc, which was a general pressure symptom, due, no doubt, to the dropsical condition of the ventricles, there was the localizing one of left homonymous hemianopsia. From the nature of the lesion it is clear that this was basal in origin. In its gradual growth from the convexity toward the ventricle the cyst could hardly fail, considering its size, to exert pressure downward, beyond the basal ganglia, and impinge upon the optic tract. The point of pressure must have been behind the corpora geniculata, for the promptness with which the pupils reacted to light and accommodation showed that the latter (being the reflex centres of the iris) were not involved by the pressure and remained intact. The tract behind the corpora geniculata, however, between these and the cortical visual centres, was entirely interrupted, for the hemianopsia was complete. Central vision, however, was good.

Headache. That a tumor of very considerable size may exist in the cranial cavity without giving rise to headache has time and again been observed in cases of this class. But here we are confronted with the

[1] I am well aware that this substitution theory is still a mooted point, but clinical evidence speaks in its favor.

apparently paradoxical phenomenon that, with increasing size of the growth causing the pain, the latter ultimately disappeared. In spite of the very pronounced "descending neuritis" giving evidence of general brain pressure, there was in the latter months of the development of the tumor not a trace of headache. This feature of the case might be explained by assuming that in the beginning, when the pressure of the developing echinococcus was brought to bear directly upon the sensitive nerves of the dura mater, pain was the result of irritating the living nerves of that membrane; that these latter in the course of time became necrosed by the ever-increasing pressure, and that thus the pain ceased. This is, of course, not to be regarded as an explanation, but only as an attempt at such, of the difficult and obscure problem of the genesis and nature of the headache in some cases of intra-cranial growths.

Reflexes. Of the superficial reflexes only the plantar was tested. It was found to be present.

The knee-jerk could be elicited on the unaffected side with difficulty, and was slightly exaggerated on the left.

Examination of the mass removed. Besides the common sac, which was torn and broken up in shreds by the scraping process resorted to in the operation, there were a number of larger and smaller vesicles, the total mass constituting about a handful of material. Under the microscope the characteristic scolices of echinococcus could be shown. They were abundant, and were demonstrated in the living state at a meeting of the St. Louis Medical Society, March 21, 1891.

It is difficult to make even a rough estimate of the number of heads contained in the whole mass, but, judging from the abundance of brooding capsules found, almost all of which contained living parasites, the specimen must have contained many thousands of such heads. Many of these were, no doubt, set free by the rupture of the capsules produced during the operation. Their failure to re-develop is possibly to be accounted for by the not inconsiderable discharge of cerebro-spinal fluid due to the puncture of the lateral ventricle. The mass of the fluid was probably sufficient to wash them away and carry them outside of the cranial cavity.

Time and manner of infection. The time could not, of course, be established with any degree of certainty. It probably does not date back much over a year previous to the operation. The handling of the diseased (and undoubtedly infected) dog, which could be demonstrated as the more than probable cause of the infection, shows once more the great danger to which children are exposed when allowed to fondle dogs.

The fact that the echinococcus occurs most frequently in communities (*e. g.*, Iceland) where people live in close contact with these animals should be heeded more than is done at present. Owing to the scarcity of post-mortems in our country the number of echinococcus infections,

whether of the brain or other organs, is impossible to estimate. But I believe it is not overstating the case when I say that only a minimal percentage of echinococcus infections in children are diagnosticated or even suspected, and that more obscure affections are due to the invasion of the organism by this parasite than is commonly believed. I have no doubt that with legitimate brain surgery becoming more widely disseminated and understood by the generality of surgeons, more cases will come under observation within the next few years than one would, at first thought, be inclined to believe. The cases of operative interference for echinococcus of the brain have all occurred within the last few years. It is, perhaps, needless to call special attention to the fact that in all of them the patients were young people.

Thermal abnormalities. There was an elevated temperature before and after the operation. According to the researches of Ott,[1] Hughlings-Jackson, Sawadowski,[2] W. Hale White,[3] and others, the chief heat-producing centres are in the corpus striatum and in the cortex around the Rolandic fissure. Both of these heat centres were implicated in this case. The temperature was highest (105.4°) when their disturbance was greatest—*i. e.*, when the hernia cerebri had reached its greatest dimensions. The rapid fall and return to the normal so promptly after the pad had been applied is very instructive, and amounts almost to the precision of a physiological experiment. No attempt was made to ascertain the existence of any difference of temperature between the right and left sides.

It is, perhaps, of some interest to call attention to a case mentioned by Sawadowski,[4] and reported by Bagojawlensky, in which a high temperature in a patient could be explained post-mortem only by the existence of echinococcus cyst in both the corpora striata.

The Prognostic Features of the Case.

Instances of spontaneous discharge and cure of cerebral echinococcus through the cranial bones—the convex walls as well as the base of the skull—through nose and mouth, have been reported. Cases of cerebral echinococci discharging into the ventricles and thus causing death are also on record. In this case, judging from its clinical course and the condition revealed by the operation, death of the child would have been only a matter of time. The sac had been constantly enlarging, and, instead of making any further inroad by corrosion upon the skull-bone

[1] Journal of Nervous and Mental Diseases, 1888, xiii. p. 85; January, 1889.

[2] "Zur Träge über die Localization der Wärme-regulirenden Centren," etc., Centralbl. d. med. Wiss., 1888, Nos. 8–10.

[3] "On the Parallelism Between the Three Thermic Mechanisms and Dr. Hughlings-Jackson's Three Levels," Brit. Med. Journ., 1890, p. 949.

[4] Mentioned in the article sub. 2.

it delved down into the brain substance, and, as stated above, only a translucent membrane—possibly the ependyma—separated it from the ventricle.

Fortunately, the hydrops of the ventricle was only beginning, the descending neuritis only moderate, central vision still good; so that, in this respect, the termination was a happier one than in the only other successful case extant—that of Graham and Grubbe, whose patient remained blind.

It was, likewise, a favorable feature in our case that no epileptic distubances had as yet manifested themselves. However successful an operation may have been, the epileptic change in the brain substance is ever to be dreaded as soon as a well-pronounced epileptic seizure has once taken place. Nothing of the sort, not even unconsciousness, had ever been noticed.

That no mental impairment took place is, as a matter of course, due to the location of the lesion in the right hemisphere. A like defect in the opposite one would doubtless have left a considerable degree of mental failure behind.

STREPTOCOCCUS OSTEOMYELITIS IN CHILDREN.[1]

By Henry Koplik, M.D., and W. W. Van Arsdale, M.D.,
of New York.

I. Etiology.

By Henry Koplik, M.D.

The class of cases dealt with in the investigations to be spoken of in this paper are not uncommon, nor do they appear here for the first time. They are scattered throughout medical literature. Strange to say, it is not until a comparatively recent date that we can note any attempt to describe and classify them under a heading in accord with our modern views and ideas. The etiology of the cases included in this paper has been variously linked with sepsis, pyæmia, and the vague term of infection. It would seem at the present day that we could sift a satisfactory conception of sepsis or pyæmia from the immense mass of accumulated work, both experimental and speculative, of our literature. On the contrary, our work in this direction is still formulating. The most original minds have hesitated to reject previous theories, and refrained from inventing new formulæ in order not to make apparent confusion still greater. This state of affairs arises from the great dif-

[1] Read before the New York Academy of Medicine, December 17, 1891.

ficulty encountered when we attempt to apply the experimental results obtained in animals to the human subject. Robert Koch, in his classic brochure upon wound infection, has hesitated to introduce new terms into our nomenclature. In doing so he has simplified to a very great extent the application of sepsis and pyæmia. He retains the early definitions of Davaine. Septicæmia and pyæmia will thus include all diseases the result of any wound infection. Septicæmia is a term which he applies to all cases of general traumatic infection in which no metastatic deposits occur. Pyæmia is applied to those diseases in the course of which these may be present. Confusion had hitherto resulted from a variety of conceptions upon the nature of sepsis and septicæmia, which included the active coöperation of some putrid matter and its introduction into the circulation. Thus we have the term sapræmia (Mathews Duncan). Cohnheim and Birch-Hirschfeld have also appealed to this active element of intoxication in cases of septicæmia and pyæmia.

With the development of our ideas upon the processes named above, we have not as yet eradicated the traces left by former work. Koch indicated that the line between septicæmia and pyæmia was not so very distinct as some were apt to suppose. For in some cases of septicæmia we may find microscopic metastases identical with those found in pyæmia. Babes insists that sapræmia is but a variety of sepsis. Rosenbach includes under his classification of sepsis, first, a form in which the organism is invaded by a ptomaine without the presence of microorganisms in the blood (sapræmia of Ogston, Duncan). The second form includes a bacterial invasion. His conception of pyæmia is not materially different from that described above. The definition of Gussenbauer, that pyæmia is a general infection resulting from the reception into the circulation of the elements of infected pus, is of passing interest in this connection. Nor can we at the present day feel entirely satisfied with that part of Rosenbach's definition of pyæmia which assumes two forms of this condition—one in which a very marked focus of suppuration has preceded, another in which a small focus of insignificant area has preëxisted. Inasmuch as the symptoms of both these forms may differ in severity at times, in other cases this may not be so. It is not surprising to find, therefore, that another term has crept into the literature. In order to group a class of cases which might present symptoms and conditions common to both septicæmia and pyæmia, we have been given the term septico-pyæmia. Ogston maintained that septicæmia, pyæmia, and septico-pyæmia were one and the same disease, due to micrococcus infection. The forms of septico-pyæmia dealt with in this paper are those cases met with in infants and children. They have followed an infection through a wound in the cutaneous or mucous surfaces, at the umbilicus, or elsewhere. They may follow the absorption of micro-

organisms through wounds left by the infectious processes of diphtheria, scarlet fever, measles, or they may follow a pneumonia or empyema. Study has been directed especially to that class of cases in which a certain manifestation of this infection becomes the chief care of the physician and surgeon. The cases referred to are those septico-pyæmias resulting exclusively in arthritic symptoms, joint suppurations, bone infections. It may be repeated with pardonable emphasis that these cases are really traumatic wound infections in the sense enunciated by R. Koch. We find in the early literature of these cases that Orth, in 1872, supposed that those diseases of the newborn connected with puerperal fever were a "mycosis septica." Weigert, at the time, described an umbilical ulcer in one of these cases as covered with micrococci. The study of joint suppurations in infants, following infections and infectious diseases, is so linked with the immense literature upon sepsis of infants that to merely sift the cases of joint suppurations would probably alone occupy the extent generally given to a historical brochure. The masterly lectures of Max Runge upon Diseases of the Newborn contain cases of his own of joint suppurations, and many references to literature of exhaustive nature. I will refer the reader to Runge's work, and satisfy myself with a few very marked examples as they strike the reader of the later literature.

J. Abercrombie presented to the Pathological Society of London in 1881 a shoulder-joint, which was one of several infected articulations in a child that had suffered from empyema following measles. In this case the joints were disorganized and the bones necrotic. H. Ashbey collected 500 cases of scarlet fever, in 12 of which joint complications occurred. In 2 of these 12 cases there was what the author calls purulent synovitis. Litten comments upon these purulent joint complications of scarlet fever. He examined at this time the pus taken from some of these joints, and found cocci and bacilli. In some there was no change in the cartilages, in others erosion, and in others separation of the epiphyses. A little later than this, Brieger, who began to agitate the doctrine of mixed infections, examined the knee-joints of cases of infection of a puerperal nature, and found microörganisms (staphylococci and streptococci) in the pus of the affected joints. He brought to the foreground the theory that in the acute infectious diseases the soil was prepared for the invasion of pus-generating microbes. This, with the investigations of Löffler, who first demonstrated these mixed infections in diphtheria, has an important bearing on a full understanding of these cases, as will be seen from what follows in this study. J. H. Morgan also presented to the Pathological Society of London the case of an infant four weeks old, with multiple articular suppurations. He classified the case as pyæmia, but did not apparently go any further. Hochsinger relates a case of supposed umbilical infection in which no

other history could be definitely established. This infant, twelve days old, presented multiple joint suppurations. Hochsinger found streptococci in the pus of the joints. When Löffler, in the course of his studies upon diphtheria, isolated a streptococcus which caused peculiar joint suppurations when injected into the circulation of rabbits, Heubner published a case in which joint suppurations followed scarlet fever. Heubner examined the pus in the joints of his case, using cover-glass stainings only. He found a chain coccus, which he assumed was possibly identical with the chain coccus described by Löffler (streptococcus articulorum). From the above scattered notices it can be seen how clinicians began gradually to seek a cause for these serious, and at times fatal, suppurations of joints other than the hitherto accepted but vague term of pyæmia, or, as formerly, even the term of rheumatic joint. Strange as the assertion may appear, it is impossible to come away from the study of the work upon the class of cases named in this paper without the impression that attention was diverted from a true appreciation of the exact nature of joint suppurations in this class of septico-pyæmias by a false interpretation given to the classical work of Rosenbach, Becker, and Struck upon osteomyelitis. The class of cases and their complications included in this paper will be shown to be really cases of osteomyelitis, but an osteomyelitis due to a different microörganism than that which engaged general attention in the early history of this bone disease. The first idea of a specific osteomyelitic microbe seemed to pervade all work at this time. If we compare the work of Krause in Volkmann's clinic with that of Lannelongue, Achard, Courmount, and Jaboulay, we see how all these authors were working upon exactly similar cases, but making diverse conclusions. The gradual overthrow of the doctrine of a specific osteomyelitic coccus marks the turning-point in the explanation of joint suppuration and bone affections in the class of cases of which we write. The work of the French school in this field is both classical and convincing. Lannelongue, Achard, and others have proved that not only the staphylococcus isolated by Rosenbach may cause osteomyelitis, but streptococci, as also various other pus-producing microörganisms. I need only point to the recent contribution of Lannelongue and Achard in the *Annals of the Pasteur Institute* to convince the most sceptical upon these points.

Lannelongue and Achard began their work by a discovery of chain cocci in the suppurating joints of infants the victims of puerperal infection. They finally proved the capabilities of this chain coccus in the production of osteomyelitis. These chain cocci, as will be seen, were long known to exist in the pus of these joints. Krause, among others, had proven their existence by modern culture methods; but there is in this latter work the same hesitancy to fill up an unexplained

space in the bacteriology of these cases. The life history of the development of our ideas on the subject of osteomyelitis proceeded along two very distinct lines, and the immense literature can be very much simplified if we keep this in mind in our study. The earlier studies were confined almost exclusively to those forms of this disease which were caused by the microörganism first called by Billroth the staphylococcus, a term adopted by Ogston, Schüller, Nepveu, Rosenbach. The later studies were confined to the peculiar conditions under which the streptococcus or chain coccus could cause the same acute disease. Finally, to-day we have the union of ideas in the doctrine that any pus-producing microbe, even the pneumococcus of Fränkel, may be an active agent in the production of acute osteomyelitis. The universal influence of Pasteur is noticed in the early history of this disease. He, in 1880, identified the staphylococcus already described by Lücke, Klebs, Eberth, in foci of infectious osteomyelitis as identical with the microbe found in ordinary furuncle. Following upon this we have the work of Becker and Struck, and the classical brochure of Rosenbach, upon the osteomyelitis due to the active agency of the staphylococcus pyogenes. The work of Rosenbach influences very greatly subsequent work in this direction. Though Rosenbach found in rare cases the staphylococcus associated with the streptococcus, he did not award to the latter microbe the dignity in the causation of osteomyelitis that he did to the former. He seemed to regard the streptococcus more in the light of a mixed infection. Rosenbach stopped here. The work of subsequent authors, instead of attempting to enlarge that of Rosenbach, rather attempted to narrow it down to an application which could scarcely have been intended by the author. Some investigators seemed imbued with the idea that the staphylococcus of Rosenbach must be regarded as the only causal agent in acute osteomyelitis. This fixed idea seemed to cloud all their work. F. Krause, working at the time in Volkmann's clinic, investigated a number of suppurating joints, as also cases of osteomyelitis. Krause found in a number of suppurating joints, accompanied by destructive processes of the heads of the bones, streptococci. He also found staphylococci in foci of osteomyelitis. Rejecting the cases which showed streptococci as pyæmic or septic, he directed most of his attention to certain micrococci which he regarded as identical with those isolated by Becker and Struck. He made some experiments in which an attempt to obtain artificial osteomyelitis without traumatism, but simply the injection of the above organism into the circulation, failed. He obtained the results published by Becker and Struck by inflicting traumatism and obtaining subsequent osteomyelitis in an infected animal. We know now that these organisms experimented with early in the history of osteomyelitis were probably staphylococci identical with those isolated by Pasteur. Yet the color of a specific microbe given to the subject of acute osteomyelitis by Becker

and Struck was not without great influence. Garre corroborated the work of Rosenbach and Müller later and maintained the presence of the staphylococcus in cases of epiphysary osteomyelitis. Kraske has intimated that in certain cases of osteomyelitis there is a mixed infection, and that future investigations might show that every microörganism capable of producing suppuration could produce osteomyelitis. He mentioned intestinal mycosis also as a source of infection. The history of the study of osteomyelitis due to streptococci (streptococcus pyogenes) is most interesting, inasmuch as it is so closely connected with the class of cases upon which this paper is constructed.

These cases have certainly been the subject of study from the time of Pasteur's first publication to the present day. Rosenbach found streptococci in suppurating joints and in bones. He attributed to this organism great destructive powers, and metastatic properties which were not possessed by the staphyloccus. Later on Krause, as mentioned above, also isolated streptococci from the pus of suppurating joints in cases similar to those subsequently studied by Lannelongue and Achard. I have mentioned above the work of Brieger, Litten, Hochsinger, Heubner, to show that these cases were being actively studied over an extended period of time. We owe to the French school the best work upon this division of the subject of osteomyelitis. Though Garre attributed to the streptococcus pyogenes the power of producing acute osteomyelitis, and denied that there was any specific microbic influence in this disease, it must be conceded that these ideas were developed experimentally more satisfactorily than hitherto by Lannelongue and Achard, and also Courmount, Jaboulay, and Rodet. It had been demonstrated by Löffler, Babes, Marie Raskin, that the streptococcus existed in certain affections as a constant, though perhaps adventitious quantity. It was strongly influential in causing lesions which resulted from the secondary invasion of the economy by this microbe. Babes, in his very convincing work upon septic processes in children following scarlet fever, diphtheria, etc., found the streptococcus in the spleen, kidneys, and other organs. Lannelongue and Achard not only found these streptococci in joints of children the victims of infection after birth or infectious diseases, but, with Courmount, Rodet, Jaboulay, turned their attention to the manner of action of these microörganisms in a series of animal experiments. Lannelongue and Achard have but recently, in the *Annals of the Pasteur Institute*, proved to their entire satisfaction that not only could the staphylococcus pyogenes aureus and albus produce osteomyelitis, but also the streptococcus pyogenes and the diplococcus pneumoniæ of Fränkel and Weichselbaum. These authors succeeded in producing experimental osteomyelitis without previous traumatism with the staphylococcus and streptococcus, a fact not hitherto generally admitted by all authors.

CASE I. *Septico-pyæmia; joint suppurations; streptococcus osteomyelitis.*

January 26, 1891. Female infant aged two weeks; mother had had repeated abortions, and was under treatment, for decidual emdometritis, with a mixture of biniodide of mercury. Infant when born and during subsequent week had all the appearance of a well-developed, healthy infant. No eruption of any kind. The umbilical wound did not heal; it became red and inflamed about a week after birth. Ordinary zinc ointment was applied by parents. The nurse, after a few days, noticed at the bath that the infant had pain in the right lower extremity; later on the knee became swollen and painful.

Status: Well-nourished infant, weighing eight pounds; skin of a very healthy hue; no eruption about face, mouth, genitals, or any part of the body suggestive of syphilis; no rhachitis (congenital). The right knee is swollen, fusiform in shape, fluctuating; great pain on manipulation; no other joint affected. Temperature 102°; bowels correct.

Umbilicus presents a suppurating wound, and its vicinity is of a livid red hue; indurated, cord like structure could be felt running under the skin to the pubes. This was supposed at the time to be the inflamed vein. A needle introduced into the joint withdrew a thin, dirty-yellow pus. At operation (incision and introduction of drain), half an ounce of the same pus was evacuated.

29*th.* Apparent improvement, less swelling about the joint, less pus. The lividity of the umbilicus has disappeared, but the umbilical wound is still suppurating.

February 2. Discharge of the affected knee less; baby is restless, does not sleep; left knee is now painful, but no swelling or fluctuation. Rectal temperature 101°; bowels correct and normal; general appearance good.

15*th.* The above temporary improvement has given way to a decided change for worse; marked pallor and weakness present. There is a swelling alongside of the left knee, also one in front over the femoral artery. Exploration alongside of knee with needle withdrew serum; this, bacterioscopically, contained nothing. The hip-joint opened by an incision, in front over the most prominent part of the femoral swelling; pus evacuated. The joint found involved. Temperature 100°–100⅘°, pulse 150 at times.

21*st.* Infant pale and much weaker; fluctuation and swelling underneath the left mammary gland opened, and found to contain pus. It was established at subsequent examinations that this pus had burrowed along the muscular planes from a mediastinal abscess resulting from a suppuration of a costo-sternal articulation. The probe touched exposed bone at one point. This mediastinal abscess at times simulated effusion in the pericardial region when accumulation occurred; this disappeared with discharge of pus.

March 21. Infant has steadily lost ground. Knee, hip, and mediastinal suppurations progressing. Temperature low, ranging from 100°–100½°; pulse 120–150. Knee on 22d opened freely; heads of bones found disorganized and necrotic. Hip opened with incision for resection; head and neck of femur entirely destroyed; great trochanter found in a necrotic state. Trochanter removed and drains inserted. Abscess of chest opened, and it was found that a sinus led from the mammary region to the mediastinal aspect of the sixth costo-sternal articulation. Sudden death two days subsequently. At no time could disease of the lungs, heart, or other organs be established. Urine contained no casts or albumin.

CASE II. *Scarlet fever; streptococcus invasion; streptococcus osteomyelitis manifested by multiple joint suppurations.*—Female, aged two years; Russian parentage.

January 27, 1891. Two weeks ago child brought to the dispensary with scarlet fever; returns to-day. Mother says that she noticed the child had swellings in the joints; no other history; people very ignorant and can give no connected data.

Status: Child pale; surface of the skin puffy, whitish; there is active desquamation; lips fissured; temperature 101°. The left hand is much swollen from the wrist down over the dorsal surface of the hand. Skin

bluish and œdematous. Swelling includes the wrist down to the metatarso-phalangeal joints. The ring finger of the right hand also swollen at the first phalangeal joint; skin here much thinned, red, and at most prominent point yellowish. Needle introduced into wrist and other joints; a thick, white, creamy pus withdrawn. Heads of the bones found bare and necrotic, grating against the probe and each other. Incision and drainage.

31*st*. Temperature 102°. Moderate amount of discharge from the joints; no other joints involved; complete disorganization of wrist- and finger-joints; bones forming joints grate against each other when moved.

February 2. Right elbow opened; pus discharged; left elbow swollen, but on account of bad general condition of patient the joint was not opened.

5*th*. Right elbow discharging; the radial and ulnar joint involved. There is now general anasarca and fever. Joints again examined and complete disorganization found in the joints of the ring finger of the right hand. Broncho-pneumonia, which was established January 31st, has progressed, involving lower lobe of the left lung. Urine contains no casts, but large numbers of leucocytes and albumin.

9*th*. Left elbow opened and pus evacuated; temperature 103°; pulse rapid and feeble; urine as above; general anasarca.

10*th*. Death. No autopsy.

CASE III.—Female infant, aged ten months; Russian.

May 7, 1891. Patient became ill four weeks ago with fever and slight cough; the parents say that there was flushing of the face at this time, but there is no distinct history of a rash. Later, the baby brought to me; broncho-pneumonia found. A few days ago, the mother noticed swelling of the wrist and elbow. The cough and dyspnœa increased.

Status: Infant pale, emaciated, and suffering dyspnœa. Examination of the chest shows a broncho-pneumonia on the right side of the chest, middle and lower regions of the lung. The right wrist is swollen, red and painful, and fluctuating. Wrist aspirated, and a yellowish-green pus removed. Incision; drainage; temperature 103°; pulse 145; respirations as above.

9*th*. Temperature 104°; pulse 160; dyspnœa. No fluid in the chest (at least as shown by needle). Discharge from the wrist is sero-purulent. Joints probably disorganized. There is œdema of the hand, and the elbow is swollen and red. No fluid in the joints.

18*th*. Temperature 102° to 104°; pulse 168. Baby is pale, prostrated; respirations 48. Evident dyspnœa. Needle introduced into chest and a serous fluid withdrawn from right side. Joints as follows: The wrist-joint is not only mobile and completely disorganized, but the epiphysis of the radius seems to be separated. The elbow shows increased mobility of the bones, and probable separation of the radial epiphysis. Discharge from the joints slight but continuous. Elbow-joint suppurating. The shoulder-joint on the same side a little swollen.

June 1. The patient having recovered from the broncho-pneumonia, and the effusion in the chest having disappeared, it was deemed safe and advisable to perform an operation for the evident osteomyelitis of the radius. The wrist- and elbow-joint opened; the radius found lying in a groove of tissues denuded of periosteum. The radius removed entire. No trace of periosteum evident; nothing but a granulating groove found in which the bone lay. The patient made an excellent recovery. The affected forearm, when healed, was held by the patient in a state of pronation.

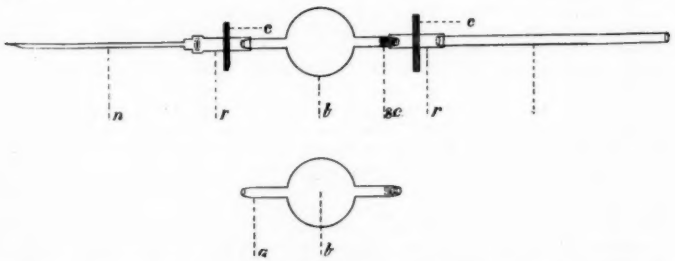
CASE IV.—(*a*) Male infant, five weeks old; born in United States, Russian parents.

June 5, 1891. Mother says the infant was born at the end of seventh month (?), and that delivery was attended with difficulties. She was quite ill after delivery, but made a good recovery. The umbilicus of the infant was much inflamed in the first week after delivery, and the mother noticed swelling of the left elbow; it was also painful; the swelling grew worse, followed by swelling of the hips. Within the past few days the left tempero-maxillary articulation became swollen. The infant cries when moved.

Status: An atrophic, pale infant, weighing about three pounds; slight fever—101°; pulse too feeble and rapid at wrist to count accurately. Most marked swelling is that of the left elbow; the joint bones very movable, showing complete disorganization of joints. Skin over elbow thinned and livid, and in one place yellowish (pus). Large fluctuating swelling over the left hip. Needle introduced withdraws pus and strikes bare bone. The right hip shows a fluctuating swelling, as also the left temporo-maxillary articulation. The umbilicus is not red or inflamed, but a drop of pus can be squeezed from it.

The investigation of the above cases was confined to a bacteriological examination of the pus in the affected joints, the isolation of pure cultures, their injection into animals—rabbits, mice—and a study of the results thus obtained. The pus was withdrawn from the joints after carefully cleansing the outer skin by means of a large hypodermatic needle, which was attached to a bulb of glass from which the air had been previously exhausted. All parts of this apparatus, a description of which will be found in an appended note,[1] had been carefully steril-

[1] *Description of an aspirating bulb used to obtain pus and fluid in the above work.*—The apparatus used for obtaining purely sterile specimens of pus from the joints of the cases in this paper consists of a glass bulb (*b*), which has two prolonged tube ends. Both of these are stuffed with cotton, and the whole is sterilized in the dry oven. When ready to use, one end is cleared of cotton (*a*), and both ends are fitted with small pieces of rubber tubing (*r*). Each rubber tube is sterilized in steam previously. In its centre is placed a small clamp (*c*); a large-sized hypodermatic needle is attached at one end (*n*), and a piece of glass tubing is attached at the other end. The clamp at the



proximal extremity is opened, that at the needle end being closed, and the air is thoroughly exhausted from the glass bulb by means of the mouth. The proximal end of the tube in the bulb being occluded with cotton, no moisture from the mouth reaches the bulb. When the air is exhausted from the bulb the proximal clamp is closed. The needle is now entered into the joint, and when we are satisfied that it is in the cavity of the joint, the distal or needle clamp is opened and pus or fluid will flow into the bulb. If the pus is thick it may be aided to flow through the needle by suction. Nothing can reach the mouth or the bulb through the mouth, being prevented by the cotton (*sc*). The needle end may now be clamped when the specimen is obtained, and the bulb is closed by clamps at both ends, and may be transported or kept for future examination. A new bulb and rubber tubing is used each time, the cost being slight. The needle is cleansed and sterilized with dry heat.

ized—the needle and glass with dry heat and the rubber tubing with steam. No possible contamination of pus withdrawn from the joints could occur in this apparatus. The pus was examined in its crude state on cover-glasses, then sown upon obliquely solidified glycerin-agar, glucose-agar, or simple agar. Plates were also prepared of the above media, also peptone-gelatin, for the isolation of pure cultures. The pure cultures were again transferred to tubes of the various agars and gelatin or bouillon, and studied. All minutiæ of the Koch methods were closely adhered to and will not be further repeated here. The animal experiments at first consisted in a few subcutaneous bouillon injections in the rabbit. Subsequent to these, all injections were made directly into the circulation, through the bloodvessels in the ear of the animal. Mice were injected at the root of the tail. After death, cultures of the animal's blood were made, and studies of pus in the joints carried out on the same lines as had been done in the case of the pus obtained from the patient's joint. Tissues of the experimental animal were stained and studied by picro-carmine, gentian-violet, ammonia carmine. The bones were also examined, softened by picric acid. In the animal experiments a bouillon culture was used, and in conveying the disease from animal to animal the spleen pulp was rubbed up with sterile bouillon and this solution injected into the circulation of the animal.

The microörganism found in all of the above cases, without any variation, was a streptococcus. This streptococcus was invariably in a pure state in the pus withdrawn, sometimes from two or three joints of the same case. There was no contamination or presence of a second microorganism, and in all the cases this streptococcus seemed to be the same microörganism. It acted the same in both artificial culture and animal experiment. Three of the four cases were proved to act similarly in the animal experiments. In the fourth case the pus was simply artificially cultivated. The presence of a staphylococcus was looked for, but was absent in every case.

If the pus obtained from any and all of the joints was spread upon cover-glass and stained with gentian-violet, it was seen to contain cocci exclusively in chains of shorter or longer extent. The chains were slung in knots; they were partially deprived of stain by the Gram method. When compared to the chain cocci obtained by the same procedure from the pus of empyema, there was no gross difference of appearance. The empyemas were broncho-pneumonic and septic, as in cases published by the author. The simple stains, as above, of the pure culture showed very little or no gross variation from streptococci obtained from the sources above mentioned. The presence of more delicately formed chains of streptococci of smaller diameter in empyema pus did not give any support to the opinion that there was any specious difference between the two sets of microörganisms. For in some of the pure cultures of

streptococci obtained from the joints in the above cases, some chains of streptococci could be found in which the diameters of the individual cocci were smaller than others. The chains obtained from the joint pus in pure bouillon cultures were sometimes very extensive; the cocci composing them at times were seen flattened transversely against each other, or there was a bright line (reminding one of the divisions mentioned by Löffler) running the whole extent through the centre of the chain; there were also lines seeming to divide the cocci transversely. These appearances are seen in the larger cocci. In other chains these appearances were not found. I compared the above microörganism with others obtained from another source, as the empyema streptococcus, and could establish the above appearances here also. The leucocytes in the specimens of crude pus, spread and stained upon cover-glasses, seemed at times to enclose the streptococci in pairs or small chains of two or four sets of pairs or more. This appearance in the crude pus of the joints was also found in the pus withdrawn from the chest in empyemas. The streptococci arranged in pairs are interesting, showing that the simple presence of cocci arranged thus in joint pus may be mistaken for microorganisms which are met in diplococcus form. This has been referred to by many authors and also by myself, in a previous article upon "Joint Complications in Cases of Gonorrhœal Vulvo-vaginitis of Children." Culture methods will guard against errors. Though the simple clinical history of the above acute cases excluded the possibility of tuberculosis, still, for the sake of completeness, the crude pus was stained for the bacillus, with negative result.

If the pus was sown in peptone gelatin in plates, there appeared generally on the fourth day small colonies, which had a slight opalescent look against a black background. Microscopically, by transmitted light, these colonies had a very light straw-color and finely granular appearance. They grew darker as they grew older. The gelatin was not fluidified, and the colonies were found deep, near the surface, or upon the surface. In agar, with or without glucose or glycerin, the colonies presented much the same appearances; they were microscopic at first, becoming larger in a few days; straw-colored at first, then darker. In platinum-needle cultures in gelatin, there appeared after four or five days a very delicate growth along the course of the puncture; this had a delicate white appearance against a dark ground. It was made up of fine bead-like colonies. The growth rarely grew to any marked thickness and generally stopped at a certain point. There was not any tendency to spread at the surface, except immediately around the puncture opening. There was never fluidifaction. The transfer of colonies from gelatin or agar to bouillon, and maintaining the bouillon at a temperature of 37½° to 39°, caused the medium to become generally turbid over night, then there was a deposit at the bottom of the tube of flocculi; the

bouillon became gradually clear, and left along the sides of the test-tube a finely granular appearance, which became more dense toward the bottom of the tube, where the deposit existed. The centre of the bouillon was finally clear. There was no variation in the above in any of the specimens obtained from the pus of any of the joints. The pus was really in its first state a pure culture of these streptococci. If a platinum loop of the pus was drawn over the surface of an obliquely solidified agar (glucose, or glycerin, or simple agar) over night, there appeared in the thermostat a finely granular coating—moist, scarcely perceptible, in minute beads—on the surface. This became more pronounced after a few days, of a faint, whitish hue against a black background. The growth advanced to a certain extent, then ceased to extend. The transfer to plates showed a simple uniform growth—that described above—the streptococcus. I made a few potato cultures; after seven days a small pellicle could be distinguished with the lens, of the color of the potato. It presented nothing characteristic. From the above it will be seen that this streptococcus did not present any characteristics which, upon artificial media, could be said to be peculiar to it alone, or distinguish it from streptococci obtained from other sources, as phlegmon or empyema. Tubes of sterilized milk stained with litmus were also inoculated with this streptococcus. The milk became coagulated; the coagulum was characterized by the presence of spaces in which bubbles of gas appeared; the litmus was changed to a pinkish or reddish hue.

REVIEWS.

HUMAN MONSTROSITIES. By BARTON C. HIRST, M.D., Professor of Obstetrics, and GEORGE A. PIERSOL, M.D., Professor of Anatomy and Embryology in the University of Pennsylvania. Part I. Folio, pp. 88; seven photo-engraved plates and eighteen woodcuts in the text. Philadelphia: Lea Brothers & Co., 1891.

TERATOLOGY is a department of pathological anatomy, or, more strictly speaking, of abnormal embryology, which has hitherto received less attention in this country than its real importance justly entitles it to. There have been very few American investigators, students, or writers on the subject up to the present time. Indeed, no systematic treatise on teratology exists in the English language. In fact, the entire American literature of the subject, embracing every pamphlet, essay, and journal article that in any direct way relates to it, can readily be held between the thumb and fingers of the right hand.

The French, Germans, Italians, and several other nationalities have bestowed a great deal of attention on the embryology, classification, and anatomical description of human and animal monstrosities, and their languages are quite rich in valuable literature on the subject.

The reviewer of the work under consideration has long been impressed with the necessity of a concise and comprehensive handbook of teratology, which should teach the elements of the science, including the embryogenesis of all forms of abnormal development, the classification, nomenclature, and description of typical cases, illustrated with figures representing the external configuration and internal structure of representative cases, both human and comparative. In an ideal treatise of this character, ample if not exhaustive references to the literature of the subject should constitute a cardinal feature. In order to do this without needless repetition it would require a complete alphabetical and numbered list of authors on the subject, which could be conveniently referred to in the text by the numbers, thus bringing the whole materials of teratology to the practical knowledge of the student.

A work such as we have indicated would also require a glossary of all the numerous terms that have been employed by teratological writers, past and present, including the etymology, synonomy, definition, and, as far as possible, the authorship of every term that strictly pertains to teratology. This scheme may be regarded as impracticable on account of the enormous amount of labor involved; this, however, is not as great as at first sight might appear.

The reviewer is not aware that all of this work has ever been done and published in any single treatise, in any language; and so far as a glossary is concerned, that it has ever been attempted by any author.

At the present time the task would be rendered comparatively easy by compiling the terms from our exhaustive dictionaries, and the literature from general and special lists to be found in existing treatises on the subject; and, particularly, from that stupendous and magnificent monument of industry, the *Index-Catalogue* of the Library of the Surgeon-General's Office, U. S. Army. In volume ix., pp. 387–424, under the heading "Monsters," will be found seventy-four columns of titles of works, essays, and journal articles, which could be readily put in one alphabetical list, and numbered for reference. As this inestimable work will never be in the possession of but a very few persons, it is obvious that the "monster" references should be appended to a systematic treatise on teratology.

After these preliminary remarks, we will direct attention to the first fasciculus of the joint work of Professors Hirst and Piersol, of the Medical Department of the University of Pennsylvania, on *Human Monstrosities*. This part consists of eighty-eight folio pages of text, including eighteen woodcuts and seven photographic process plates. The publishers inform us that when all the four parts are completed the work will consist of about one hundred and fifty pages, and forty-nine plates from nature. The part now issued is indeed sumptuous. Folio in size, large brilliant type, heavy splendid paper of magnitude to afford grand margins, superb plates, the figures having the effect of relief on jet-black backgrounds, are all in harmony, and unite in giving a charm to the first pretentious work on teratology in the English language. It would be impossible to bestow too much praise on the publishers for their skill and liberality in the manufacture of this magnificent book. It is our duty to examine somewhat critically the text of the treatise in order to give a judicial opinion of its intrinsic merits, and to show how far it falls short and how nearly it meets the requirements of the ordinary student who is in search of knowledge concerning this branch of science, be he an anatomist, physiologist, or obstetrician. There are two positions from which to view this work. First, to compare it with other systematic works on teratology which had an existence previous to the advent of this, and, secondly, to consider its own individual merits. We desire to deal fairly with the authors of the work under review. Unlike most reviewers, we have read every word of the text—no very lengthy task, however, since the pages do not contain more words than those of ordinary octavo size. The essay by Prof. Piersol on the production of malformations is an admirable epitome of the latest and best information that exists on the subject, and cannot be excelled either in style or quality within a limited space of less than fifty pages. Prof. Hirst has made very short work of his department, which consists of brief definitions of some of the simpler forms of malformations, and descriptions of a few illustrative cases. The seven large plates, each representing a single fœtus, are intended to cover congenital umbilical hernia, spina bifida, encephalocele, and deficient development of the extremities.

We are told that the original intention of the authors was to publish a series of plates representing the monstrosities contained in the Museum of the Medical Department of the University of Pennsylvania, with brief descriptions of the same. The work grew upon the authors to such an extent that they resolved to make the publication a systematic treatise on teratology.

Our profession ought to be very much pleased to possess this beautiful work, wherein they will find the rudiments of teratology, illustrated by admirable plates, of American specimens, of the principal and most striking forms of human monstrosities. The authors deserve all the credit that they modestly claim, viz.: that "the work should in a measure fill a gap in English literature, and familiarize the public with the treasures of an American collection." We regret that they have restricted themselves to the treasures of a single American collection, since there are to be found in the pathological museums in New York City, and in Boston, particularly that belonging to the Harvard Medical College, rare teratological "treasures" of almost every known variety. The great sheets of this work can be readily made each to contain from two to four figures without damaging the artistic effect, while it would greatly increase the interest and enhance the value of the atlas.

It is to be hoped that this work may awaken so much interest in the subject that some competent author will prepare a systematic treatise on the elements of human and comparative teratology, illustrated by well-executed woodcuts representing the external configuration and internal structure of all forms of monstrosities, also an exhaustive glossary of the terms relating to the science, and a complete bibliography of the subject. Such a work would require an octavo of from five to eight hundred pages.

It is impossible to treat the subject properly in less space than we have indicated. The work of Vrolik is in two quarto volumes, one of which consists of an atlas of one hundred lithographic plates of several figures each. Ahlfeld's work contains three hundred pages of octavo text, and an atlas of forty-nine large folio plates embracing an aggregate of seven hundred and sixty-six figures. The work of Cesare Taruffi, of Bologna, *Storia della Teratologia*, still in course of publication, has reached its fifth *tomo*, the five volumes containing 2661 pages. These are a few of the works, which are mentioned to give the reader an idea of the magnitude of the science of teratology. The literature of the subject is vast. The reviewer glories in the possession of more than four hundred treatises, large and small, general and special, on the subject under consideration. We shall wait impatiently for the appearance of the succeeding parts of the superb atlas of *Human Monstrosities* by Hirst and Piersol, and in the meantime take pleasure in recommending the work to the general practitioner, to the obstetrician, and to students of physiology, embryology, and other branches of biology. G. J. F.

LECTURES ON OTORRHŒA AND ITS COMPLICATIONS. Delivered at the London Throat Hospital in connection with the London Post-Graduate Course. By W. R. H. STEWART, F.R.C.S., L.R.C.P.Ed., etc. Second edition. Pp. 80. London: John Ball & Sons, 1891.

IN this brochure the author desires to state a few facts relating to the symptoms, treatment, and sequelæ of otorrhœa, "hoping to draw the attention, more especially of the general practitioner, to the ruinous practice of allowing a discharge from the ear to continue untreated, and to show how easily a cure may be affected in the earlier stages, and so

perchance save not only the hearing-power and perhaps the lives of a number of patients, but also prevent them from going about with what, at times, is a most offensive discharge, and becoming a nuisance to themselves and all about them."

The description of disease and symptoms is clear and succinct, but the treatment is antiquated and many of the instruments are clumsy. No Eustachian catheter should have a bulbous end like the one in Fig. 14, p. 26, of this work. Aspiration by means of an instrument is not required after paracentesis of the membrane in acute otitis media; it is also very painful and provocative of further inflammation. Elasticity of the distended tissues will empty the drum-cavity fast enough after paracentesis.

In chronic suppuration the line of treatment marked out is antiseptic and aseptic, but beyond instillations and injections of antiseptics, which are not sufficient alone to induce a cure in most cases, nothing of value is suggested. It is amazing to see so much time spent on artificial membranes and the treatment of pyæmia and mastoid disease, usually fruitless, and not *one* word about improving drainage and freeing the conductors of necrotic tissue, by excision of the diseased remnants of the membrana tympani and ossicula, and thus preventing pyæmia, mastoid caries, and cerebral disease. The explanation may be found in this instance in the fact that the author is more of a rhinologist and laryngologist than an aurist; but students should be taught all they will require and what many of them are now demanding, though their would-be teachers in some instances fail to give it. But the advance of science is inexorable and teachers should be better prepared than some of them seem to be, to teach their pupils all they ought to know about modern otology.

This little brochure might have been written, in fact it sounds as though it had been written, a generation or two ago; but it is no worse nor better than many books on otology published to-day but written for the past, and in which either the truth is suppressed or the author does not know what is being done in otology. In either case the task of the author is not done perfectly and the book has little value.

C. H. B.

THE RATIONAL CURE OF DEAFNESS AND DISCHARGE FROM THE EAR. By SAMUEL SEXTON, M.D., assisted by ALEXANDER DUANE, M.D. 8vo, 90 pp. New York: J. W. Vail & Co., 1891.

IN turning to this brochure, we find, as it were, a supplement to the deficiencies of the one just reviewed, for in Dr. Sexton's monograph is set forth "the modern treatment for the radical cure of deafness, otorrhœa, noises in the head, vertigo, and distress in the ear." There is found in Chapter I., "History of the former operations upon the ear and the reason for their failure;" Chapter II., "The modern operation—what it is;" Chapter III., "Necessity for the operation;" and in Chapter IV., "The operation in chronic catarrh of the middle ear." This chapter contains the notes of many cases and the results of the operation. Chapter V., "The operation in chronic discharge from the middle

ear." This also contains notes of many interesting and successful cases. Chapter VI., "Immediate and remote effects of the operation."

Referring again to Chapter II., we learn that the patient is first completely anæsthetized, so as not only to be entirely free from pain, but also to remain perfectly still during the operation. Then the field of the operation is brilliantly illuminated by a lantern, containing an incandescent electric light, attached by a head-band to the surgeon's forehead. The separate steps of the operation are not numerous, but they require knowledge of the anatomy, and skill. The first thing to be done is to get the drum-membrane out of the way. "This is effected by making a circular sweep with a delicate knife, specially devised for the purpose, which separates the membrane from its attachments all around. Then the incus is disjointed from the stapes, and removed or not, according to the indications of the case. The third step consists in the removal of the malleus, when, except for the careful cleansing and dressing of the parts, the operation is complete."

In considering the necessity of the operation (Chapter III.), the author says, that "the unanimous testimony of all competent aurists is, that a procedure which shall enable the surgeon to arrest the otherwise inexorable progress of the chronic suppurative and chronic adhesive processes of the middle ear is one of the greatest desiderata." A similar necessity exists for some means more satisfactory than that at present in use, in cases of so-called chronic catarrh of the middle ear, also denominated by various other names, such as "dry, sclerotic, hyperplastic, proliferous, or adhesive inflammation or catarrh of the middle ear." Here the chain of bones becomes rigid, and finally more or less ankylosed: the Eustachian tube may become more or less occluded or unduly patulous; and in many cases newly formed bands of fibrous tissue stretch across the drum-cavity, binding the tympanic structures together, thus rendering them more rigid than before. These changes are followed by progressive deafness in all cases and by tinnitus aurium and vertigo in many. These are the cases that go the rounds of aurists' offices, enduring syringings, inflation of the tympana, injections into the Eustachian tubes, treatment of the nares, naso-pharynx, and throat, sometimes with slight benefit, oftener with none. "Audacious as it may seem to stigmatize forms of treatment so universally adopted as both useless and harmful, the fact nevertheless remains, corroborated by the experience of all otologists, that no improvemont does accrue from their continued employment. . . . In the operation of excision we do have an efficient remedy for this class of cases; the hearing is not only retained at its former height, but is frequently, nay, generally, permanently increased; the tinnitus and other disagreeable symptoms are relieved," and the patient not only kept from getting worse but made permanently better.

In chronic suppuration of the middle ear this operation not only checks the disease, but in doing so, prevents suppuration and caries of the mastoid and tegmen tympani, thus warding off phlebitis of the sinuses, pyæmia, and cerebral abscess, with their fatal results.

The operation as set forth in Dr. Sexton's brochure is a most valuable addition to aural surgery, and as such must now be permanently added to the equipment of the surgeon who desires to practise otology with success. Justice to his patient demands that he shall use this means of

cure in such important diseases, and therefore he dare not pass it by with ridicule or scorn.

The author deserves the thanks of both physician and patient for recording his labors and successes with this operation, and no aurist can afford to be without the work, or to neglect its teachings, if he wishes to be abreast of the times. C. H. B.

LES PIERRES DU POUMON, DE LA PLÈVRE, ET DES BRONCHES, ET LA PSEUDO-PHTHISIE PULMONAIRE D'ORIGINE CALCULEUSE. Par le DR. S. A. MARIUS POULALION, Ancien Interne des Hôpitaux et de l'Hospice de la Salpêtrière. G. Steinheil, Éditeur. Paris, 1891.

CALCULI OF THE LUNG, PLEURA, AND BRONCHI, AND PSEUDO-PULMONARY PHTHISIS CAUSED BY CALCULI.

THIS work considers in a very comprehensive way the various forms of bony growths and calcareous deposits found in the air-passages, including the larynx, trachea, bronchi, lungs, pleura, bronchial glands, and pulmonary vessels. The subjects are treated from a pathological, clinical, and therapeutic standpoint. The author quotes histories of illustrative cases from medical literature, besides adding a few personal observations. The special consideration of many of these processes seems to be unnecessarily full, as the morbid processes considered do not form a series of lesions peculiar to the air-passages, but are the special manifestations in these tissues of some of the general pathological processes, and occur under the same conditions and in the same manner in other parts of the body, and they have no clinical significance or importance.

There are, however, some sections of the work which are of great interest, especially those dealing with the primary bony growths in the lungs, and pulmonary pseudo-phthisis of calculous origin ("pseudo-phthisie pulmonaire d'origine calculeuse").

The former of these deals with a subject that has had little or no attention in this country, and but little in Europe. The subject has no clinical importance, but it has great pathological interest. These bony growths occur as larger or smaller masses in the lung, or as branching spicula of bone, and the latter are sometimes scattered everywhere through the pulmonary tissue in large numbers. They do not seem to be related to the bloodvessels or the bronchi, but are found in the interstitial tissue of the lung. Some of the spicula are an inch and a half or two inches in length, and in some cases they constitute the only anatomical lesion, while in other cases they are associated with a chronic interstitial pneumonia. No satisfactory explanation of their occurrence has been advanced by the author, or by previous writers on this subject.

The consideration of "pseudo-phthisie pulmonaire d'origine calculeuse" is very full and valuable from both a clinical and pathological standpoint. This term is applied to an affection which is often characterized by the symptoms and physical signs of pulmonary tuberculosis, but which differs from the latter by the absence of tubercle bacilli in the sputum, and by the expectoration of bronchioliths, or bony or cal-

careous concretions derived from other parts of the air-passages than the bronchi. The affection is produced by inflammation and ulceration brought about by the direct action of a calculus on the pulmonary parenchyma. The calculus may have been formed in any part of the air-passages, but has finally found lodgment in the pulmonary parenchyma. A peculiar group of acute and alarming symptoms are often associated with the expulsion of concretions, and to this syndrome the author has applied the term bronchiolithic crisis—*crise broncholithique.*

The work evinces much careful study, and is a valuable contribution to a subject that has received but little consideration. H. M. B.

NOTES ON THE EXAMINATION OF THE SPUTUM, VOMIT, FECES, URINE, AND BLOOD. By SIDNEY COUPLAND, M.D., F.R.C.P., Physician to the Middlesex Hospital, and Lecturer on Practical Medicine in the Medical School; Examiner in Medicine at the Examining Board for England. London: H. K. Lewis, 1891.

THE author states in the prefatory note to the first edition that the book is written for the use of the students attending his class, and the reader is referred for fuller details to larger works on these subjects. The first twenty-two pages of the pamphlet contain a description of the general characters and composition, with the microscopical examination, of the sputum, vomit, and feces. The appearance, quantity, and composition of the sputum in different disease conditions is pointed out, and the several methods given for the detection of elastic tissue and the staining of tubercle bacilli are clear and concise. Each step in the various latter processes, with time required and strength of reagents used, is definitely stated.

In the examination of the vomit, its quantity, character, reaction, and microscopical examination are considered, special stress being laid upon the significance of the excess or diminution of free HCl. The microscopical examination in this connection simply consists of a tabulated list of the various objects which may be found in the microscopic field, no details as to methods of preparation or differentiation being given the reader.

The examination of the feces is considered under the same general heads as the vomit and sputum. The author here considers at some length the leading characters, both macroscopic and microscopic, of the chief varieties of intestinal parasites. In the twenty-five pages devoted to the examination of the urine the author gives in a condensed form the general and physical characters of the chief sedimentary deposits as well as the quantitative and qualitative analysis. The last seven pages are given to the specific gravity, estimation of hæmoglobin and microscopical examination of the blood, in so far as is necessary for ordinary clinical purposes.

Brevity is the chief characteristic of the work—in fact, it supplies to the student the same kind of information as one finds in the ordinary quiz compend. Dr. Coupland has in his small manual given to medical students a very condensed but quite clear idea of the *modus operandi* of

examining the subjects considered, and as a knowledge of this portion of medicine is essential, the book is one which is certainly worthy of a place in every undergraduate's library.

As an aid to the memory and a rapid reference-book to the student, the work is of value, the only criticism that is justifiable being that its brevity is such that facts only can be stated; causes and inferences must be supplied by the reader. E. E. G.

MINOR SURGERY AND BANDAGING: INCLUDING THE TREATMENT OF FRACTURES AND DISLOCATIONS, TRACHEOTOMY, INTUBATION OF THE LARYNX, LIGATURES OF ARTERIES, AND AMPUTATIONS. By HENRY R. WHARTON, M.D., Demonstrator of Surgery and Lecturer on Surgical Diseases of Children in the University of Pennsylvania; Surgeon to the Presbyterian Hospital, the Methodist Episcopal Hospital, the Children's Hospital, and the Drexel Hospital for Children; Consulting Surgeon to the Rush Hospital for Diseases of the Chest, etc. 12mo, pp. vi., 497. Philadelphia: Lea Brothers & Co., 1891.

As indicated by its title, this is far more than a mere book on bandaging and the surgical procedures ordinarily included in works on minor surgery. It treats as well of some of the graver matters of our science. But when we bear in mind the extended experience of its author, a fact sufficiently testified to by the number and responsibility of the public appointments held by him, it becomes at once apparent that this extension of sphere must add largely to the value of the book. Then, this extension, which constitutes a large part of the volume, is appropriate in a work sure to fall into the hands of students and young practitioners, as the matters treated are those which the youngest surgeon may be called upon to deal with, and which very often do not admit of the deliberation and choice of operator permissible in so large a proportion of surgical proceedings. Another, and amply sufficient, justification for the enlarged scope Dr. Wharton has seen fit to adopt, will be found in the way in which he has done his work. Such clear, forcible, and practical directions as he gives are not likely to be criticised wherever they may be found.

Yet while cordially approving the enlarged sphere of the book, we must demur at that classification, however approved by usage, which makes tracheotomy merely an item of minor surgery. It is usual to speak of tracheotomy as an operation which every recent graduate should be ready to do, without warning, and with facility. All of which is very true. Yet we venture the opinion that the medical student, or hospital resident, who has opened the trachea in a short-necked child, will grow to old age ere he finds himself called upon to discharge a more perplexing duty, or one requiring more nerve for its performance. Short of an amputation at the hip-joint or the ligation of some large vessel, none of the operations described by Dr. Wharton will be found more difficult or involving greater anxiety on the part of the operator.

It will be understood that it is only with the location of tracheotomy, and not Dr. Wharton's description of it, with which we are dissatisfied.

As there is no one better qualified by large experience to speak of tracheotomy, so no more satisfactory account of the details of the operation can be given than the one contained in this volume.

With this criticism of classification, in which our author merely follows the usual course, we have nothing more of an adverse character to say.

The illustrations are numerous and good. An especial feature is the reproduction of many of them from photographs. The result is less diagrammatic, but much more realistic and faithful representations of bandages as they are seen, though they do not make the turns more perceptible to the eye, and they, therefore, seem to have few advantages for mere purposes of demonstration.

The book is well printed, is substantially bound in cloth with hot-pressed back and corners—which look much like leather—and we have no hesitation in saying that the purchaser of Dr. Wharton's work may rest satisfied that he has one which is the equal of any within the limits laid down by its author. It bears many tokens of faithful and honest labor in its preparation, and while properly conservative in spirit is fully abreast of the times in the great advances made of late years.

S. A.

PTOMAINES, LEUCOMAINES, AND BACTERIAL PROTEIDS; OR, THE CHEMICAL FACTORS IN THE CAUSATION OF DISEASE. By VICTOR C. VAUGHAN, PH.D., M.D., etc., and FREDERICK E. NOVY, SC.D., M.D. Second edition, revised and enlarged. Philadelphia: Lea Brothers & Co., 1891.

THE fact that a second edition of a purely scientific work like this appears within three years of its first appearance, is sufficient proof that it has been received by the profession with more than common interest. This may largely be accounted for by the systematic arrangement and the practical manner which the authors successfully adopted for it. Although the subject-matter may be said to be quite recent in its origin, it is scattered throughout scientific literature in such a way as to make a collation and compilation in a readable manner, adapted to the medical profession, a difficult task. This the authors accomplished in the first edition, now adding to it furthermore all that science has since then developed in this direction. The authors' prediction that bacterial products rather than bacteria themselves would be found causative of disease, has by this time been probably generally accepted. Though the recent failures in certain directions by protective inoculation with bacterial products have upset or rather shaken the belief in their efficacy as practical therapeutic agents, their powerful action on animal and man must be held up as an argument as to their power for harm, if not for good.

This book is one that is of the greatest importance, and the modern physician who accepts bacterial pathology cannot have a complete knowledge of this subject unless he has carefully perused it. To the toxicologist the subject is alike of great import, as well as to the hygienist and sanitarian.

It contains information which is not easily obtained elsewhere, and which is of a kind that no medical thinker should be without.

L. W.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D.,

PROFESSOR OF CLINICAL MEDICINE IN THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

METACETIN.

PROFESSOR MASIUS, in the *Bulletin de l'Académie Royale de Médecine de Belgique*, tome v., No. 10, p. 715, reports the use of this remedy in eight cases of typhoid fever, fifteen of articular rheumatism, and several of pulmonary tuberculosis presenting a hectic fever of an irregular type. This remedy, introduced by Fr. Mahnert, is a derivative of amido-phenol. He concludes that it is a powerful antipyretic; in dose of three and one-half grains, repeated in an hour, it lowers elevated temperature through several degrees. This lowering is gradual, the maximum being reached in two or three hours, and is maintained one hour. Its antipyretic action is apparent in the first half-hour, and persists three or four hours, followed by an elevation to the original point. With the exception of abundant perspiration, there are no secondary or dangerous symptoms, as vertigo, headache, distress, digestive disturbance, eruption, chilly sensations, cyanosis, or collapse. It acts not only as an antipyretic but also favorably and rapidly in articular rheumatism, although in this respect it is inferior to salicylate of soda. It compares favorably with antipyrine and with phenacetin, which it resembles, and is superior to antifebrin and kairin, in that it does not possess poisonous properties.

DEATH DURING CHLOROFORM ANÆSTHESIA.

DR. T. LAUDER BRUNTON gave a short description of the results of the Hyderabad Chloroform Commission at the last annual meeting of the British Medical Association (*The British Medical Journal*, 1891, No. 1612, p. 1088). The questions were, how far death was due to the action of the anæsthetic (*a*) upon the heart, (*b*) upon the respiration, or (*c*) upon both, and to the effect of shock from the operation. It is pretty well established that chloro-

form is a universal protoplasmic poison, and will destroy the contractile power of individual cells, of cilia, and of muscular fibres; but it is contended that when administered by inhalation it acts more readily upon the respiration than it does upon the heart, and from the respiration failing first, a sufficient quantity to paralyze the heart is never conveyed to it, and that therefore death is respiratory death, beginning with the respiration, and not with the heart. Reviewing the work of the first and second Commission, and that of the Glasgow Committee, it may be said that the great risk of death lies in the occurrence of asphyxia during administration. In comparing its action with that of ether, it was found that the latter was a less powerful anæsthetic, and that although neither will paralyze the heart when giving plenty of air, the heart will beat longer during asphyxia with ether than with chloroform. In attempting to determine the effect of shock as a cause of death, the writer defines "syncope" as a temporary stoppage of the heart's action, and which may be rapidly recovered from, and "shock" as due to paralysis of the abdominal vessels, which is a grave and persistent condition. Efforts to produce syncope by raising the head, by attempting to stimulate the vagus reflexly, or even by direct irritation, seemed to show that stoppage of the heart's action through the vagus was not a dangerous condition. Attempts to produce shock by a blow upon the intestine, or by such an operation as evulsion of the toe-nail, were unsuccessful.

Sulphonal as a Sedative and Hypnotic.

Dr. T. Carlyle Johnstone, in the *Journal of Mental Science*, 1892, No. 124, p. 55, gives an analysis of fifty cases of mental disorder in which this drug was used. He arranges his results in three divisions: 1. The effects produced by single doses, or doses separated by long intervals. 2. Those produced by doses repeated at intervals of forty-eight hours. 3. Those produced by doses repeated at intervals of twenty-four hours or more frequently. His practice, as the result of the experiments described in this paper, is to begin with single doses administered in the evening, and, when necessary, to repeat them at intervals of forty-eight hours. If this is found insufficient to produce sleep and quiet, the interval is next reduced to twenty-four hours. In this way a satisfactory hypnotic effect has always been obtained; but when the excitement is intractable, and the drug is employed primarily for its sedative action, it is not infrequently found necessary to further reduce the intervals by giving it twice a day, namely, in the morning and evening; greater frequency has not been found to have any distinct advantage. He concludes that, *in properly regulated doses*, it is an efficient hypnotic, and, compared with other hypnotics, its action is fairly certain and constant. The sleep produced by it is natural and tranquil and undisturbed by dreams. It has no injurious effect upon the circulation, respiration, appetite, digestion, or temperature, or on the general health. After a time it may be discontinued or the dose reduced, the patient continuing to sleep well. It has a distinct sedative action in mental excitement or distress, and may be employed with great benefit in cases of insanity, especially in such as are of a recent or acute character. Its chief disadvantages are the slowness of its action and the tendency of the action to be prolonged into the succeed-

ing day, and to be followed by drowsiness, confusion, giddiness, or fatigue, and the serious cerebral and motor symptoms which are apt to follow repeated doses.

The Poisonous Action of Sulphonal.

Dr. Camillo Fürst has a timely paper on this subject in the *International klinische Rundschau*, 1891—No. 48, S. 1876; No. 49, S. 1919. He notes such symptoms as twitching of the muscles, nausea, vomiting, vertigo, fainting attacks, tinnitus, chilly sensations, paralytic weakness, ataxia, diminished pupillary action, diarrhœa (rarely), obstipation, ischuria or complete anuria, lowered temperature, cardiac weakness, impairment of respiration, cutaneous eruptions, hallucinations, and amaurosis. In spite of all these symptoms, with greater or less reason attributed to sulphonal, in single doses it is devoid of danger, and in daily use for long periods of time it is harmless, but the moment that symptoms of kidney derangement arise, or there is diminished peristalsis, repeated doses or even its daily usage is absolutely contra-indicated.

The Treatment of Impotence in Men.

Dr. Victor v. Gyurkovecky, in the *Wiener medicinische Presse*, 1891, presents two papers (No. 46, S. 1738; No. 47, S. 1780). He reports complete cure by suspension in Sayre's apparatus in three cases of sexual neurasthenia. In cases where this condition is the result of gonorrhœa, he anoints his catheter or endoscope with balsam of copaiba to get its effect upon the mucous membranes, makes a thorough examination and cures the local condition. He has treated with benefit one case, and to no effect one case of masturbation (a most frequent cause of impotence), by hypnotic suggestion. In sexual neurasthenia he has treated two cases by hypnotic suggestion, one to a cure and the other with benefit, although he is yet under treatment. From these cases he concludes that hypnotic suggestion is a powerful remedy for masturbation, pathological pollutions, and the various forms of impotence.

Guaiacol Carbonate in Tuberculosis.

Drs. Richard Seifert and Fritz Hölscher, in a very practical paper, add much to the knowledge of the creasote derivatives in the treatment of tuberculosis (*Berliner klinische Wochenschrift*, 1891, No. 51, S. 1195). Recognizing the fact that creasote, although of very great value in therapeutics, yet causes much digestive disturbance, varies much in the proportion of guaiacol which it contains, also that the so-called "absolutely pure" guaiacol contains, at best, only 90 per cent. of this agent, he uses guaiacol carbonate, which has the formula $CO(OC_6H_4OCH_3)_2$. Administered as guaiacol carbonate, no irritation results, and no free guaiacol can be found in the intestines, but in one-half to one hour after injection it can be detected in the urine. Commencing with a dose of one-third to one grain, the daily dose of ninety grains was gradually reached. Even in this dose there was not observed any disturbance of the digestive, circulatory, or nervous system. The symptoms of improvement are an increase of appetite, improvement of nutri-

tion, increase of body weight, and an increase of the power of resistance of the organism; the attacks of coughing were milder, expectoration easier—more mucous than purulent; the fever and night-sweats less noticeable; the patient more contented during the day and at night could sleep better; there was also an improvement in the physical signs. Four cases, to illustrate the result of this treatment, are reported. Two patients who had taken creasote, and one guaiacol, with little benefit, with this treatment were greatly improved. Some cases that had improved under guaiacol carbonate, lost weight and their good bodily condition when put upon creasote. This remedy must be continued for a long time after all active symptoms have disappeared, and in these cases all other means must be employed—regulated diet and a treatment for each individual patient.

Guaiacol in the Treatment of Pulmonary Tuberculosis.

Drs. A. Weill and M. S. Diamantberger have practised intra-pulmonary injections of two per cent. of this remedy in oil of vaselin (*Journal de Médecine de Paris*, 1891, No. 49, p. 530). They have never noted any complication other than a slight cough, with or without some usual expectoration; once only there was a scanty bloody expectoration, which soon stopped of itself. In well-marked cavities these injections *in situ* are indicated, and our authors have not hesitated to make them with pure guaiacol or in a concentrated solution with sterilized oil. They have also used hypodermatic injections, according to the formulæ of Guttmann and of Bouchard. For these injections a pure article must be used.

Cantharidinate of Potash in the Treatment of Pulmonary Tuberculosis.

Dr. W. Soltau Fenwick and Mr. Arthur Welsford have published the results from this remedy in sixteen cases (*The British Medical Journal*, 1891, No. 1617, p. 1349). After calling attention to the fact that in investigating the influence of a drug upon the progress of organic disease a wide distinction must be drawn between subjective and objective symptoms, they conclude:

1. The cantharidinate of potash is absolutely useless in producing any obvious beneficial effect in pulmonary tuberculosis.

2. That in doses exceeding $\frac{1}{120}$ of a grain it is apt to induce albuminuria, with pain in the loins, strangury, and even hæmaturia.

3. That for the latter it should in no case be used without the most careful supervision, and that it is therefore ill adapted for out-patient practice.

In respect to laryngeal tuberculosis in the two cases observed, no improvement in this condition was detected.

Dr. E. von Rennenkampff records sixteen cases (*St. Petersburger med. Wochenschrift*, 1891, No. 25, S. 213) of the use of this remedy. The report is not favorable.

Is Impure Chloroform Dangerous?

Under this title Dr. René DuBois-Reymond gives the results of a laboratory study, using in the experiments the cardiogram of Cowl and Gad

(*Berliner klinische Wochenschrift*, 1891, No. 53, S. 1225). The conclusions drawn from experiments in which the impure residue after crystallization of absolutely chemically pure chloroform was used are (for dogs): Inhalation of the residue diminishes the time of the stoppage of the respiration, as compared with pure chloroform, in the average of 7 to 11; the blood pressure at the moment of the cessation of respiration is less after inhalation of the residue as compared with that after chloroform; on the contrary, the frequency of the heart-beat is greater. Believing that the amount of the impurities present is variable, he finds an explanation in the difference of the reports of the Glasgow Chloroform Committee (danger due to fall of blood pressure and paralysis of the heart) and the Hyderabad Commission (danger due to respiratory with secondary cardiac paralysis)—the latter being symptoms due to impure chloroform. The argument of the paper is for the use of absolutely chemically pure chloroform, since it is not a question of the degree of dilution of poisonous material in an indifferent substance, but in one that of itself calls for care in administration.

Injury to the Stomach from Catheterization.

In the *Münchener medicinische Wochenschrift*, 1891, No. 52, S. 903, Dr. Friedrich Crämer reports two cases of injury to the mucous membrane, from its being sucked into the eye of the instrument and a piece being forcibly detached. It is important to use only soft rubber instruments, siphons in place of pumps, and allow the fluid in the tube to escape backward into the stomach as it is gradually withdrawn.

Treatment of Chlorosis.

Dr. Alois Pick, in the *Wiener klinische Wochenschrift*, 1891, No. 50, S. 939, goes over this subject from the standpoint of auto-intoxication. Good results may be obtained by administration of hydrochloric acid, β-naphthol with salicylate of bismuth, stomach-washing if dilatation; while a drop of creasote taken with sugar of milk after meals has been followed by great benefit.

Mechanical Treatment of Chlorotic Amenorrhœa.

Hans Adolphi gives full details of the successful treatment of a patient by means of pelvic massage (Thüre Brandt), particular attention being also paid to the alimentary canal, basing his theory upon the doctrine of fæcal anæmia, as propounded by Sir Andrew Clark.—*St. Petersburger medicinische Wochenschrift*, 1891, No. 31, S. 271.

Salophen.

Dr. Paul Guttmann has been studying this drug in the Moabit Hospital at Berlin (*Berliner klinische Wochenschrift*, 1891, No. 52, S. 1209). The drug contains about equal parts of acetyl-paramidophenol, and salicylic acid, and is intended for the same purposes for which the acid is used; the dose being sixty to ninety grains per day. It reduces pain and swelling, but does not protect against relapse. It apparently does not markedly reduce the tem-

perature. In chronic rheumatism the results were not so favorable as in the acute. It is likely that other properties than as an anti-rheumatic may be found for it. In the dose given above no untoward symptoms have been observed.

Jambul in Diabetes Mellitus.

Dr. H. Hildebrandt, in the *Berliner klinische Wochenschrift*, 1892, No. 1, S. 5, contributes a paper upon the method of action of this now well-known remedy. He believes that it is upon the vegetable diastase and also upon the sugar-forming ferments of the blood-serum, saliva, and pancreatic extract; an analogous influence upon trypsin and pepsin has not been determined. In diabetes, then, it is useful, because it diminishes the change of starch into sugar in the alimentary canal, and in the tissues the change into sugar of glycogen.

Dr. George Foy, in the *Medical Press*, 1892, No. 2749, p. 29, goes over the botany and pharmacology of the drug. After a careful analysis of the literature he concludes that the record is very fluctuating—marked success attained for very unpromising-looking cases by some physicians, and with the most carefully selected cases and perfectly pure samples of the drug others have failed to get any benefit from it. That the drug has an influence on the conversion of starch into sugar is shown by the experiments of Lascelles Scott, T. A. E. Balfour, and G. Sims Woodhead.

A New Styptic.

Dr. A. E. Wright, in the *British Medical Journal*, 1891, vol. ii. p. 1306, presents the results of his laboratory experiments upon a new styptic, and upon the possibility of increasing the coagulability of the blood in the vessels in cases of hæmophilia and aneurism and internal hemorrhage. He believes that, as shed blood can be kept permanently liquid by converting the lime salts in the blood into insoluble oxalates by the addition of small quantities of any of the soluble salts of oxalic acid (Arthur and Pagès), so a fibrin-ferment, to which 1 per cent. of the bichloride of calcium is added, would act as a styptic. He obtains his fibrin-ferment from the blood of cattle or sheep, the former yielding more of the ferment. The blood is received from the vessels into three times its volume of water. It is then set aside until it commences to gelatinize, when it is stirred with a bundle of wires. The fibrin thus obtained is washed until it is practically free from blood corpuscles. The fibrin-ferment is extracted with five or ten volumes of water for twenty-four hours and filtered. To the filtrate is added the bichloride of calcium. He reports laboratory experiments confirmatory of his theory. Believing that the coagulability of the blood can be increased by injection—1, of this fibrin-ferment; 2, of Wooldridge's tissue fibrinogen; 3, of calcium salts; and after showing that both the first and second of these methods are inapplicable to intra-vascular coagulation, he reports his experiments with calcium salts.

Without noticing any intra-vascular coagulation as resulting from injection of calcium salts directly into the blood, nor, on the other hand, any

diminished liquidity, on the contrary he has in all cases observed a considerable increase of coagulability to follow its administration by the mouth or by the method of intra-venous injections. The practical application lies in the suggestion of administration of calcium chloride when it is desired to increase the coagulability of blood in man—internal hemorrhage (typhoid fever), *post-partum* hemorrhages from placenta prævia, and in hæmophilia. From experiments on dogs, having regard for local gastric congestion or general symptoms, the dose for man would be, approximately, four drachms to a pint of water. Calcium chloride is excreted very rapidly through the kidneys, so that the coagulability of the blood soon reverts to the normal.

The Treatment of Shock.

In the *Correspondenzblatt für Schweizer Aerzte*, 1891, No. 24, S. 745, Dr. A. Kottmann gives the details of the transfusion of salt water in the left cephalic vein to the amount of twenty-four ounces with a transfusion syringe. In cases when anæsthesia during shock is necessary he recommends ether instead of chloroform for that purpose. In cases of collapse, especially in pyæmic conditions, he combines these two methods with success, operating under ether anæsthesia, and hoping, through the transfusion of salt water, to prevent shock, and as well to free the tissues from the poison. He cites successful cases in support of these methods of procedure.

The Treatment of Syphilitic Subjects who are Predisposed to Diseases of the Nervous System.

In the *Gazette hebdomadaire de Médecine et Chirurgie*, 1891, No. 51, p. 606, appear the essential facts of a paper by Dr. Alfred Fournier, which was presented before the French Society of Dermatology and Syphilography. Taking up the question of the possibility of mercury being the cause of tabes in syphilitics, he disposes of this question by citing indisputable facts which show the impossibility that this can be the case, believing that those are predisposed to syphilis of the nervous system who suffer from nervous exhaustion (intellectual, moral, or physical), and who are of a nervous heredity. He suggests the bromides to subdue nervous excitability, and hydro-therapy as a preventive. In the actual treatment by mercury and the iodides, in cerebral syphilis, some brilliant results; in medullary syphilis, failures in greater number than successes; in tabes, in early stage, complete cure—later, eventual possibility of cure or holding the disease in check; if ataxia is confirmed, absolute powerlessness; finally, in general paralyses, in his experience, failure. He believes that greater success will be obtained in the prevention than in the cure of nervous diseases of syphilitic origin.

The Treatment of (Cardiac) Valvular Lesions.

Professor Liebermeister, in the *Deutsche medicinische Wochenschrift*, 1891, No. 46, S. 1257, gives us a very thoughtful paper. He recommends good mixed diet especially rich in proteids; water sufficient for thirst; alcohol to be limited or forbidden altogether; weak coffee or tea with two or three times

its quantity of milk is allowed; iron and cinchona preparations will aid nutrition; in summer an elevation of fifteen hundred to three thousand feet, in winter a climate which permits outdoor life. If compensation is disturbed, absolute, continued rest in bed is insisted upon. The remedies recommended to assist in obtaining compensation are digitalis, less frequently strophanthus and convallaria.

The Treatment of Cholelithiasis.

Dr. George Sticker (*Wiener klinische Wochenschrift*, 1891, No. 51, S. 962) believes that the remedies which will soften and break down the bile are salicylate of soda, calomel, podophyllin in large doses, especially when large amounts of fluid are ingested. For the colic, he strongly recommends belladonna in a well-studied argument, but in case the pain is unbearable, even when this remedy is aided by warm drinks and warm outward applications, he would use morphine with one-tenth part of atropine. He also recommends the spirits of nitrous ether as a remedy against spasm of the sphincter, and believes that Durande's and Rademacher's remedy and chloroform do not dissolve the stone, but rather act as does the nitrous ether. For purgatives he uses castor oil, rhubarb, or senna. As palliative measures he recommends ether, camphor, hot compresses, and local bloodletting.

Euphorbia Pilulifera.

This remedy for dyspnœa has received careful attention at the hands of Dr. Ch. Liégeois in the *Revue Générale de Clinique et de Thérapeutique*, 1891, No. 52, p. 815. Administered in an attack of asthma, there rapidly follows relief; the attack is shortened in duration and lessened in intensity. In spite of dust, etc., they breathe more easily. After continued use the attacks diminish in frequency. In dyspnœa of cardiac origin he has not obtained success, other methods, bromide of potash, lobelia, grindelia, and gelsemium being quite as useful. It is not an expectorant, nor indeed is it a remedy for bronchial catarrh.

The Synthesis of Natural Alkaloids.

Dr. L. Bouveault (*Revue Générale des Sciences*, 1891, No. 23, p. 787) reviews this subject, discussing the work of Séguin and Derosne, Sertuerner, Pelletier and Caventon, Gautier, Gmelin, Strecker, Liebreich, Selmi, Étard and Brieger as regards alkaloids, toxines, and ptomaines. The labor toward synthesis of Liebig, Wohler, Berthelot, Würtz, Baeyer, and Fischer receives recognition. As instances of partial synthesis are cited creatinine, codeine; of total synthesis, muscarine, betaine, xanthine, conicine. The large amount of work, dating backward only ten years, seems incredible, and when we consider the significance of this subject, we realize that we are but upon the threshold of important chemical results.

The Treatment of Cystitis by Sublimate.

Professor Guyon, in a recent lecture, gives the results of his investigations (*La Médecine Moderne*, 1892, No. 1, p. 7, also *Annales des Maladies des*

Organes Génito-urinaires, 1892, No. 1, p. 1). Three elements are considered when a cure is declared: 1, frequency of urination; 2, pain; 3, the purulence of the urine; besides, the capacity of the bladder must be considered. This method has given rise to no accident, not only so far as absorption is concerned, but not even to pain. In tuberculous cystitis an amelioration equivalent to a cure can be obtained; although the pus and frequent urination remain, yet pain always diminishes. In blennorrhagic cystitis precisely the same result is obtained; the patient does not suffer more. In similar conditions of disease of diverse origin, the results are equally good. He does not employ washing unless the bladder is indifferent to tension (distention). If washing is practised it must be with weak solutions. He prefers instillations, 1 part of sublimate to 3000 or 5000, very rarely 1 part to 850, because these do not distend the bladder, and so give rise to pain. The bacteriological study of the urine, when treated with sublimate, shows that it has a powerful preservative action against the microbes of the air, that its antiseptic power is less with cultures of urinary microbes than in cultures of ordinary pyogenic microbes; that its disinfectant power is feeble in purulent urines. In studying nitrate of silver, it was found to be a less powerful antiseptic against the microbes of the air, less, also, against the urinary microbes, and less, indeed, as a disinfectant of purulent urines.

The solutions of sublimate must be made without alcohol, distilled water only being allowed. The instillations are made into the posterior urethra as well, because that always participates in the vesical inflammation. The first instillation does not exceed twenty or thirty drops. Soon a drachm can be injected; the amount is to be regulated by the amount of pain. Instillation must be made into an empty bladder—preliminary catheterization may be necessary. In speaking of the capacity of the bladder, the author remarks that it is physiological rather than anatomical.

[The care with which these observations are made, the evidently accurate statement of facts, as well as the high reputation of the author, mark this as a very valuable contribution to the treatment of a frequently rebellious condition.—Ed.]

Antipyrine in Whooping-cough.

Dr. E. Feer (*Medical Press*, 1892, No. 2749, p. 24) believes that this remedy should have the first place in the treatment of whooping-cough. Eighty cases were under observation and the dose was in the proportion of that of fifteen grains for a ten-year old child, given morning and evening. When several children in the family were affected with this disease the results were not so good (mutual reinfection—Professor Hagenbach). The remedy was beneficial in four-fifths of the cases. It cannot be ascertained whether it acts as a germicide or as a sedative—very likely the latter, as Demme and Sée have proved that it has a direct restrictive influence upon the reflexes.

Tizzoni's Antitoxin.

Dr. Em. Finotti reports a case of tetanus successfully treated by this remedy (*Wiener klinische Wochenschrift*, 1892, No. 1, S. 1). A boy of eleven,

after injury, underwent amputation through the forearm. On the tenth day after the operation Professor Tizzoni, of Bologna, forwarded his dog-antitoxin, made from an alcoholic precipitate of blood-serum from a dog rendered immune to tetanus, in which two and a half grammes was injected with all aseptic precautions. During the fourteen days of treatment twenty-eight injections were made of this antitoxin, and of rabbit-antitoxin, which is stronger. This case, with those of Drs. Schwarz, of Padua, Gagliardi and Tizzoni, of Bologna, makes the four now on record.

DR. RUDOLF SCHWARZ'S case is reported in the *Centralblatt für Bakteriologie und Parasitenkunde*, 1891, No. 24, S. 785. A boy of fifteen, two weeks after a wound in the left forearm, developed symptoms of tetanus, for which he was treated with chloral and warm baths, with hypodermatic injections of acet-phenyl (method of Bacelli) for fourteen days. Two and one-half grammes of antitoxin from the serum of an immunized dog was dissolved in water and injected. Five days later the patient was able to arise from bed; the symptoms, however, rapidly improved after the third injection.

The following papers are worthy of notice:

"Mechanical Treatment of Certain Circulatory Troubles: the 'Esocarde' of Dr. Salagi," by DR. ED. BUYS (*Journal de Médecine de Bruxelles*, 1891, No. 22, p. 681). This is a description of a machine in use since 1885, for relief of circulatory troubles of cardiac origin by means of rhythmical compression of the peripheral circulation. Used in active hyperæmia of portal system, intestinal catarrhs and dyspepsias; chorea, chlorosis, neurasthenia, and hysteria; such febrile diseases as intermittent fever, hectic and typhoid fevers.

"Peroxide of Hydrogen," by DR. B. W. RICHARDSON (*Asclepiad*, 1891, No. 32, p. 301). A clearly written paper, abounding in formulæ, practical.

"The Treatment of Suppurating Inguinal Glands," by MR. H. PERCY POTTER (*The Practitioner*, 1891, No. 282, p. 406). Scraping out with Volkmann's sharp spoon; cavity washed with chloride of zinc, 1:24; thick pad of antiseptic gauze; firm pressure by spica bandage.

"Some Sequelæ of Influenza," by MR. T. H. DREW (*Ibid.*, p. 408). Respiratory, abdominal, and nervous. Early treatment by salicylates.

"Anti-malarial Action of Methyl-blue," by PROF. G. MYA (*Lo Sperimentale*, 1891, No. 24, p. 473). Results in some cases favorable; more frequently effect *nil*, or simply transient.

"Lactic Acid as a Prophylactic Against Attacks of Gout," by DR. BÉRENGER-FÉRAND (*Bulletin Général de Thérapeutique*, 1891, No. 48, p. 529) advises the use of thirty grains dissolved in three or four glasses of water, and drunk during the day. Treatment to be employed twenty days out of each month.

"Essence of Santal in Acute Catarrhal Cystitis," by DR. EDMOND WICKHAM (*L'Union Médicale*, 1891, No. 145, p. 808). Twelve to sixteen capsules of six grains each daily.

"Acetanilide and its Derivatives" (*L'Union Médicale*, 1891, No. 146, p. 817; No. 147, p. 829), with a paper on "Phenacetin" (*Ibid.*, No. 152, p. 889). Thorough, practical, and interesting papers.

"In the Physiological Action of Ouabaïn," DR. JOSEPH SAILER (*Thera-*

peutic Gazette, 1891, No. 11, p. 727; No. 12, p. 814) publishes an exhaustive paper. Used in pertussis, $\frac{1}{500}$ to $\frac{1}{1000}$ of a grain; very minute doses might have same action as digitalis; greatest value as a local anæsthetic; superior to cocaine, but extremely poisonous.

"Some Observations on the Use of Piperazin," by DR. HEUBACH (*Notes on New Remedies*, 1891, No. 7, p. 78) reports physiological experiments upon himself; also its use in two cases of uric acid calculi.

MEDICINE.

UNDER THE CHARGE OF

W. PASTEUR, M.D. LOND., F.R.C.P.,
ASSISTANT PHYSICIAN TO THE MIDDLESEX HOSPITAL; PHYSICIAN TO THE NORTHEASTERN HOSPITAL FOR CHILDREN;
AND
SOLOMON SOLIS-COHEN, A.M., M.D.,
PROFESSOR OF CLINICAL MEDICINE AND APPLIED THERAPEUTICS IN THE PHILADELPHIA POLYCLINIC; PHYSICIAN TO THE PHILADELPHIA HOSPITAL.

EXPERIMENTAL PROGRESSIVE MUSCULAR ATROPHY.

By means of intra-venous injections of streptococci obtained from a case of erysipelas and cultivated for six months in the serum of rabbit's blood, ROGER (*Comptes-rendus*, 1891, No. 17) succeeded in inducing in rabbits a chronic disease of the anterior horns of the spinal cord semeiologically resembling progressive muscular atrophy. Death occurred between the nineteenth and fortieth days after the inoculation. By the eighth or tenth day the streptococci had disappeared from the blood, while symptoms of amyotrophy had begun to appear. At the autopsy the muscle-fibres were found atrophic, with proliferation of the nuclei of the sarcolemma; the ganglion-cells of the anterior horns were at first partly, and subsequently entirely degenerated. The nerve-roots and the peripheral nerves remained intact.—*Centralbl. f. die medicin. Wissensch.*, 1892, No. 1, p. 9.)

URÆMIA ATTENDED WITH HYPERTHERMIA.

RICHARDIÈRE and THÉRÈSE (*Rev. de Méd.*, 1891, No. 12, p. 991) present evidence demonstrating that uræmia is not invariably attended with subnormal temperature. As a matter of fact there are not a few instances on record in which the uræmic attack was accompanied by elevation of temperature, regardless of the special form of nephritis that existed, and independently of the existence of any febrile complication. Richardière and Thérèse report three such cases, one of which terminated fatally. The temperature was observed to rise in anticipation of the convulsive paroxysms, and to decline with their subsidence. In one case it was possible to abort a seizure

by a copious bleeding as the temperature began to rise. In a number of recorded cases the hyperthermia of uræmia was associated with hemiplegia. Cerebral œdema has been a common accompaniment. The elevation of temperature is directly ascribed to the uræmic intoxication. It has been shown that normal urine contains matters some of which when introduced into the body of animals cause elevation of temperature, while others cause depression of temperature. It is conceived that the retention of one or the other of these toxic matters in greater degree, by reason of the suppression of the functions of the kidneys in uræmia, results, in the one case in elevation, in the other in depression of temperature.

Pneumonomycosis.

Freyhan (*Berliner klin. Wochenschr.*, 1891, No. 51, p. 1192) has recorded the case of a laborer, twenty-two years old, who had been complaining for a week of languor, malaise, headache, pains in the extremities, anorexia, and digestive derangement. Soon pain in swallowing, and a stitch in the side, accompanied by cough and expectoration, were added. The temperature was elevated slightly above the normal; respiration was accelerated. Excepting a few moist râles, nothing abnormal was detected in the chest, nor was there evidence of disease of the abdominal viscera. Four days after coming under observation, a hemorrhagic effusion in the left pleural cavity was detected. The sputum grew more abundant and was blood-stained, but neither tubercle bacilli nor pneumonia cocci could be found in it. In the course of another week the pleural effusion had become so large that thoracocentesis was performed, affording exit to about a pint of hemorrhagic fluid. Physical signs of infiltration of the lower lobe of the left lung now became manifest. A few days later it was for the first time noted that the sputum presented the odor of fresh yeast. Careful examination revealed the presence of plugs almost exclusively constituted of mycoderma albicans. Mouth and pharynx were found to be normal. In the progress of the case the right lung also displayed evidences of invasion. Finally, however, improvement set in and progressed to ultimate recovery.

Defecation by the Mouth.

At a meeting of the Société Médicale des Hôpitaux, Desnos reported the case of a man who was picked up on the street in an epileptiform attack. In the course of the following day several attacks occurred, which were thought to be hysterical. The most remarkable feature of the case, however, was that the saliva that flowed from the mouth was apparently mixed with fecal matter. Upon inquiry being made, the man stated that for two years he had not passed his stools by the anus, but at six o'clock each evening he passed a stool by his mouth. The man remained under observation only for two days, but his statement was corroborated. At times the evacuation took place without any effort on the part of the patient. Sometimes it occurred during a nervous attack, attended by slight convulsions, during which the patient persistently held one hand upon his back in the course of the œsophagus, where he stated there was severe pain. Several hours before

the evacuation the abdomen was distended and hard, and at its lower portion dull on percussion—manifestations that disappeared after the evacuation had taken place. There was a history of an injury in the upper and inner part of the right iliac region, although no hardness, tumor, or cicatrix could be detected.—*Wiener med. Presse*, 1891, No. 51, p. 1958.

Tracheal Tugging as a Diagnostic Sign of Thoracic Aneurism.

Dr. H. B. Grimsdale contributes to *The Practitioner*, 1891, No. 284, the results of observations made in St. George's Hospital. After admitting the explanation of the phenomenon put forward by Dr. MacDonnell, of Montreal (*Lancet*, 1891), that the cause of the tugging is due to "direct pressure of the expanded vessel (aorta) on the left bronchus," he deals with the conclusions of that observer. The first of these, "that brachial tugging does not occur in health, or in any disease except aneurism," he is altogether unable to accept. With the others he agrees in the main. The third, that aneurisms of the ascending arch do not cause tracheal tugging is corroborated by a case which occurred in St. George's Hospital. Whilst practising the manipulation on himself, the author was surprised to find "tugging," and subsequently he obtained it in two of his friends. He then made a series of observations, in conjunction with Dr. Ewart, on patients, irrespective of their disease, and a further series on medical and surgical patients in the hospital. In 118 cases so examined, tracheal tugging, distinct from "communicated" carotid pulsation, was obtained. Fifteen instances occurred among 55 females, and as many as 36 (57 per cent.) in 63 males. The cases were roughly divided into four groups, according to the intensity of the tug. There are four instances of marked tugging:

1. A case diagnosticated as aneurism of the left portion of the transverse aorta.

2. A case of a patient suffering from emphysema and bronchitis, in whom tracheal tugging was most marked in the position of expiration.

3. A girl suffering from chlorosis, in whom tracheal tugging was usually slight, but became marked on excitement.

5. A man suffering from a very large aneurism, involving the whole of the arch, in whom tracheal tugging was very strong.

Seventeen cases appear as moderate; 20 cases showed it slightly; 7 cases very slightly; the remaining doubtfully, or only under excitement.

Tracheal tugging was found in most varied conditions of heart and arteries. It was marked in one case of anæmia. It was found in cardiac hypertrophy, and also was absent in that condition. It was found in the only case of typhoid fever tabulated, and in the only case of delirium tremens. It occurred in cases of mitral disease and aortic disease, while it was also absent in those conditions. It was not markedly affected by the presence of renal disease.

The two points that strike one in analyzing the cases, are the absence of tracheal tugging in mitral disease and in phthisis.

The case of chlorosis is striking, as the heart and aorta are often below the normal size in this condition.

Several points of interest were noted; variation in degree in the same

individual; greater liability of males; greater intensity during inspiration than during expiration observed in all the cases but one.

In a case of aneurism of the ascending arch, tugging, which was only very slight in the erect position, became more marked on lying down; presumably because the aneurism fell back on the bronchus.

MacDonnell's explanation appears to be quite sufficient in ordinary cases. The effect of respiration on tugging would appear to be due to the closer apposition of the aorta and trachea during inspiration. This, though similar, is greater than the effect of respiration on the carotid pulses.

Assuming tracheal tugging to be due to the pressure of the aorta on the bronchus, there are obviously two ways in which it may be modified: (*a*) by the amplitude of excursion of the aortic wall, (*b*) by the close approximation of the two structures involved. The first, no doubt, accounts for the rarity of tracheal tugging in mitral disease. The general systemic arterial tension is low, and the excursion of the aorta small. It accounts for the general, though not universal, presence of tracheal tugging in aortic valvular disease. The second accounts chiefly for its presence in aneurism, and, I think, chiefly for its absence in phthisis.

Observations show a marked preponderance of "tugging" in people with full chests and prominent infra-clavicular regions, while in stooping patients with flat chests it rarely occurs, even under great vascular excitement.

The author concludes from his observations that the positive value of the sign is small. It occurs in 16 per cent. of cases taken at random, and in all respects is indistinguishable from that in the cases of aneurism observed by him. As a purely negative sign, tugging may be of some value.

Exophthalmic Goitre and Myxœdema.

Sollier (*Revue de Médecine*, No. 12, 1891, p. 1000) records two interesting observations in cases of exophthalmic goitre, in conjunction with one of which intermittent œdema developed, and the other of which was associated with myxœdema. The first case was in an emotional woman, thirty-one years old, who presented successively a morbid fear of riding in or in passing carriages on the street; exophthalmos, the more marked upon the left, with some degree of paresis of the external ocular muscles; derangement of menstruation; polyuria and pollakiuria; headache; hoarseness; fine tremor; flushes of heat alternating with feelings of coldness, without elevation of temperature; and increased frequency of pulse. The thyroid gland was atrophic rather than enlarged. From time to time, especially at the menstrual periods and after fatigue or emotion, a general puffiness of the body manifested itself, especially conspicuous in the face, on the neck, and in the extremities. The electric resistance was diminished. Under treatment by means of electricity and hydriatics, the symptoms were almost completely resolved.

The second case was in a woman, thirty-nine years old, who presented pain, stiffness, and intermittent swelling of the extremities. She would weep causelessly and complained of a sense of constriction of the throat and suffocation. The appetite was impaired and capricious. Sleep was deranged. The patient had sensations of heat, sometimes with elevation of temperature; she would feel chilly in the evening and would be awakened from sleep by a

sense of intense heat, with sweats and distress. There were also dry cough and slight nausea and vomiting. Constipation alternated with diarrhœa. Menstruation was suppressed. Vision became double in certain directions. Pain became generalized and prevented movement. For some time there had been polyuria and pollakiuria. The extremities were greatly swollen. The swelling in less degree involved the body gradually, and was greater at night than in the morning. The tumid tissues did not pit upon pressure. The skin was dry and rugous; its color was normal; at divers points it presented spots of pigmentation. There was some itching of the skin. Many articulations were painful and presented evidences of thickening and roughening. On careful observation, slight exophthalmos was detected. The heart was rather rapid and accelerated by emotion. There was fine tremor. The electric resistance was diminished. The thyroid gland could not be felt. As in the first case, treatment by means of electricity and hydriatics was followed by decided improvement. Sollier considers both of the cases primarily instances of exophthalmic goitre in which the thyroid gland, instead of enlarging, became atrophied, with the development of a condition of intermittent œdema in the one case, and of myxœdema in the other.

A Case of Intermittent Fever with Unexplained High Temperature.

Dr. Stephen Mackenzie places on record a case which is not open to doubt in regard to the genuineness of the temperatures registered. He says: "Expressing my doubts as to the genuineness of the temperature recorded in the present case, extraordinary care was taken by Dr. Sequeira and the nurses to prevent any manipulation or fraud, and the high readings of the thermometer were all taken when the instrument was held by the observer in one or other axilla. On one or more occasions two thermometers were simultaneously placed in the same axilla, and were found to correspond, a point of considerable importance where fraud is suspected. It was, as a rule, impossible to take the temperature in the mouth, as the patient was in the condition of a rigor, but when so taken it was raised proportionately."

The patient, aged twenty-seven years, was admitted to the hospital on October 2d. His first attack of shivering occurred in Ceylon eighteen months previously, and he had since been treated in several hospitals. On October 3d the highest temperature was 107.2°; on October 4th, 112.8°; on October 5th and 9th similar readings were obtained; on October 10th two thermometers registered 109°; on October 11th, 112.8°; and on October 12th, 113.8°. The time occupied in the return to the normal line, in some instances, barely exceeded five minutes. Shivering was not always present. The pulse never exceeded 100. The rigors which occurred were very severe, and a short hot stage was followed by profuse sweats. Except on one occasion, the patient did not seem profoundly ill when the high temperatures were recorded—nothing approaching the grave condition of patients the subjects of hyperpyrexia in rheumatic or enteric fever. The periods of hyperpyrexia were, however, exceedingly brief, and this may be taken as an explanation of their innocuousness. On one occasion the nurse found a temperature of 112° F., and went immediately to inform the sister of the ward. On the arrival of the

latter, within five minutes, the temperature was below normal—97.6° F. As recorded in the notes, no enlargement of the spleen accompanied the attacks. "I examined the blood on several occasions, but never detected melanæmia, though some pigment was observed by Dr. Sequeira on one occasion; nor could I detect any changes in the red corpuscles."

On the Knee-jerk in the Condition of Supervenosity.

Dr. T. Hughlings-Jackson makes a short preliminary communication on this subject in the *British Medical Journal*, 1892, No. 1624. He has observed absence of knee-jerks in some cases of emphysema with bronchitis, where the blood has become venous in an extreme degree. As the patients observed were near death, he hesitates to conclude that they were absent as a mere consequence of supervenosity. He quotes the case of a girl of nine years suffering from diphtheria, who was tracheotomized at midnight for urgent respiratory difficulty, producing cyanosis. Before the operation her knee-jerks were absent. On the following day, the cyanosis having then disappeared, the jerks were obtained and remained present until her discharge from the hospital. The knee-jerks of a dog artificially asphyxiated by clamping the trachea were absent in the third stage of asphyxia, having been exaggerated in the earlier stages of the condition. It is suggested that the preliminary exaggeration was owing to the loss of cerebral control over the lumbar centres, the eventual loss being occasioned by the succumbing of these strongly organized spinal centres to the poisonous influence of supervenous blood.

The testing of knee-jerks before and after the administration of oxygen to cyanosed patients may be expected to throw light on the question. If supervenosity is a cause of loss of knee-jerks, that fact may be important in the apopletic state, and possibly somewhat with regard also to post-epileptic coma. Careful observations on such cases may be productive of valuable results.

On Congenital Obliteration of the Bile-ducts.

Dr. John Thomson, of Edinburgh, contributes an exhaustive article on this subject to the *Edinburgh Medical Journal*, 1892, Nos. 1808–10. After recording a case occurring in his own practice, he analyzes forty-nine cases of the disease scattered through medical literature, in which the condition was confirmed post-mortem. The main clinical facts are briefly these:

The children themselves are either jaundiced at birth, or they become so within the first week or two of life; otherwise they are healthy and well-nourished. In some cases there is a discharge of normal meconium followed by colorless motions; in others, the feces are devoid of color from the very first. The urine is deeply bile-stained. The jaundice is of a dark-greenish tinge, and lasts till death; and the motions remain colorless. A certain proportion of the children die from umbilical hemorrhage within the first fortnight; and, of those who survive this period, a large number suffer from spontaneous hemorrhage from other situations. The liver steadily enlarges, and the spleen also. After living some months, the children become more

or less emaciated. Fits often supervene, and death ensues in the end in a state of exhaustion from some trifling intercurrent disease.

The analysis of the cases brings out the following facts:

1. All the reported cases do not amount to 60.

2. Out of 96 parents there is undoubted evidence of syphilis in 5 only.

3. Twice over, two cases occur among children of the same family, and in several of the families there is a marked history of infantile jaundice.

4. There is no evidence that the character of the labor has any causal relation with the condition.

5. So also with regard to the state of the child at birth and pre-maturity.

6. Boys are more frequently afflicted than girls: in 34 cases, 21 boys and 13 girls.

7. *Symptoms:*

Outset of jaundice, variable—either at birth or several days after. The action of cold on the body at birth as a cause is unsupported by facts: more probably to be found in the changes in the liver circulation occurring at that period. The jaundice becomes rapidly deeper and assumes a greenish tinge.

In all but one case there was bile-pigment in the urine.

With the exception of two cases, in none was the dark meconium followed by even one motion of normal yellow feces. Colorless intestinal discharges from the first points to a very early occurrence of the obstruction. The stools are mostly white or grayish from the beginning. The admixture of green lumps in a few cases at the time when the obstruction must have been complete, may have been due to the administration of mercury, or possibly result from the presence of chromogenous bacilli in the intestine.

Vomiting is mentioned in 9 cases.

The occurrence of spontaneous hemorrhage is one of the most characteristic clinical features. It was noted in fully one-half the cases. Hemorrhage in infantile jaundice is not, however, invariably followed by a fatal issue. The presence of ptomaines, or some other similar organic poisons, in the blood, owing to the withdrawal of the bile from the chyme, is suggested as a possible cause of such hemorrhage.

Fits are mentioned as having occurred in 10 cases.

The degree of emaciation depends on the duration of life. Excluding the cases dying from umbilical hemorrhage, the large majority of the patients lived more than a month.

8. *Post-mortem appearances:*

The liver is always more or less enlarged, and frequently of a dark-green color.

The bloodvessels are described as normal in 16 out of 20 cases; in the remaining 4 (which were probably syphilitic) there was obliteration of the portal vein.

The situation of the obliteration of the ducts varies almost indefinitely. There does not appear to be any seat of election. In many cases inflammation evidently continues to spread after obliteration is complete, and affects the rest of the ducts and gall-bladder. Dilatation of the canal above the obstruction is not invariable. The contents of the gall-bladder vary much.

In all cases where it is definitely stated that the motions were colorless from the first (with one exception) there was no bile found in the gall-bladder.

In 10 cases examined microscopically, cirrhosis of the liver was present in 9.

The author quotes several cases of infantile jaundice with symptoms similar to those of obliteration of the bile-ducts, but with pervious ducts. The resemblance is such that he cannot avoid the conclusion that they are examples of different stages of the same disease. The striking point is the shorter duration of the cases with pervious ducts.

The lesion of the ducts has been ascribed to: 1. Peritonitis and its results, acting from without. 2. An inflammatory or other lesion of the ducts themselves. 3. An arrest or defect of development.

The author regards the last of these as being the most probable etiology. A congenital narrowness or irregularity of the lumen of the ducts of such a nature as to render them unnaturally liable to disease from interference with the proper performance of their function, appears to him to "afford a very necessary help in explaining the causation of a large proportion, if not of all the cases."

Congenital syphilis is not considered to be of essential importance as an etiological factor.

The author summarizes his conclusions as follows:

1. In the great majority (if not all) of the cases there is, to begin with, a congenital malformation of the bile-ducts due to defective development.

2. This malformation probably affects a considerable extent of the walls of the ducts, and may consist in narrowness of their lumen.

3. The interference with the outflow of bile thus caused gives rise to catarrh, and, finally, to blocking and obliteration of the ducts, owing to the inflammatory process spreading to the walls of the ducts and gall-bladder.

4. This progressive inflammation goes on slowly spreading, the local condition getting gradually worse during many months, if the patient lives.

5. The obliterated ducts or gall-bladder, or portions of them, may entirely disappear, not even leaving a distinct band of fibrous tissue to indicate their original position.

6. The obliteration generally becomes complete at an early but variable period of intra-uterine life, but occasionally it does not occur till after birth.

7. In a few cases the inflammatory process spreads to the peritoneum, and possibly the presence of inherited syphilis may favor this extension. The occurrence of peritonitis is probably always secondary to the blocking of the ducts; and syphilis has nothing to do with the original lesion in them.

8. When the lumen of the duct is so far encroached upon as to obstruct the free passage of bile into the intestine, "biliary" cirrhosis of the liver begins, which, as it goes on, causes increasing interference with the most important functions of that important organ. The result of this is the setting up of a sort of chronic blood-poisoning, which causes vomiting, spontaneous hemorrhage, and convulsions, and gradually leads to emaciation, diminished vitality, and death.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

PROFESSOR OF CLINICAL SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE UNIVERSITY AND GERMAN HOSPITALS;

ASSISTED BY

A. C. WOOD, M.D., INSTRUCTOR IN CLINICAL SURGERY, UNIVERSITY OF PENNSYLVANIA; ASSISTANT SURGEON, UNIVERSITY HOSPITAL.

AND

C. L. LEONARD, M.D., ASSISTANT INSTRUCTOR IN CLINICAL SURGERY IN THE UNIVERSITY OF PENNSYLVANIA.

THE SURGICAL TREATMENT OF TUBERCULOUS CERVICAL GLANDS.

OWEN, in writing on this subject (*The Practitioner*, London, vol. xlvii., No. 5), emphasizes the importance of early operation. The routine treatment of iodine and poultices he considers unsatisfactory, and the administration of sulphide of calcium has been in his hands the "veriest impostor of the Pharmacopœia." Even a visit to the seaside is considered as so much time wasted. Aspiration of a suppurating gland is characterized as a half-way practice. Once a gland has broken down, an operation becomes imperative. If the surgeon does not interfere, Nature performs the work, but at best slowly and imperfectly, and with much greater deformity than after the surgeon's knife.

In those cases which are seen early the operation is a very simple affair, but unfortunately comparatively few consult the surgeon at this stage.

The operation, to be successful, must deal radically with every affected gland and sinus. Due regard must be had for the various important structures of the neck. Of these, the internal jugular vein causes the greatest anxiety, these growths at times being intimately connected with the wall of this vessel, which is frequently seen exposed at the bottom of the wound. The author refers to a well-nigh fatal attack of dyspnœa in a child on removing a sarcomatous tumor of the neck. Owing to the difficulties and dangers of these operations, it is advised to have a skilled anæsthetist and a familiar and trustworthy assistant.

It is considered a mistake to attempt to work through too small an incision or to spare the scalpel at first, though subsequently the more blunt dissection the better. Diseased skin should be sacrificed, and when all is completed the cavity may be filled with powdered boric acid and covered with an antiseptic dressing.

If the wound be a clean one primary union may be aimed at by the introduction of sutures. When the glands are broken down, however, and the curette has been employed freely, the wound should not be closed. Occasionally a second cleaning and scraping is necessary before complete healing occurs.

The author does not consider the risk of general dissemination of tuber-

culous matter after such an operation to be great, but believes, on the contrary, that the patient has been rid of much of the danger of general tuberculosis. [This is all in accord with modern teachings, and has been especially emphasized by the writer and by Mr. Treves. The one point which seems open to dispute is, as to the value of such measures as change of climate. If the case is seen early and is not rapidly progressive, and if no glands are as yet broken down or caseating, it is unquestionable that sea air or mountain air, cod-liver oil and the iodide of iron, limitation of the movements of the head by means of a collar like an old-fashioned "stock," attention to any defects of neighboring skin or mucous surfaces, etc., may sometimes be followed by resolution. Operation, though advisable, and, indeed, necessary in the great majority of cases, need not be considered the invariable rule.—J. W. W.]

Spear Wound of the Abdomen; Recovery.

Ross reports (*Lancet*, London, 1891, vol. ii., No. 24) from Molong, New South Wales, having been called to see a young male aborigine who had received a most dangerous spear wound in the epigastric region during a quarrel. On arriving it was found that the patient had been removed to an adjoining hotel, the spear, which was eight feet in length, still remaining in the wound, the projecting handle being held by a mate. The weapon entered to the left of the median line, a little below the ensiform cartilage. Previous efforts at extraction by the patient's comrades had failed, and Dr. Ross by careful examination found extraction impossible on account of two sharp pointed barbs. It was therefore decided to remove it posteriorly. Accordingly the spear was sawed off near the wound after being fixed in the direction in which it was desired to extract it. By pressing on the sawed end of the weapon, and making a small incision posteriorly, the spear was removed without difficulty and with but slight hemorrhage. The edges of the wound were cleaned and stitched and a bandage applied. During the night the patient escaped and joined his mates in the camp. On the second day he had radiating pains in the abdomen and some distention. On the following day it was found that the plaster and stitches had been removed, the anterior wound was gaping and there was an ichorous discharge. The patient was bathing the wound and abdomen with the young undershoots and leaves of the red gum tree (*Eucalyptus nostrata*). Improvement set in from this time, and on the sixth day the abdominal wound was closed and recovery was uninterrupted. The spear removed measured about seven inches. Dr. Ross attributes the favorable result to the use of gum leaves, and believes they may have a wide field of usefulness.

Inflammatory Stricture of the Ureters.

Watson (*Journal of Cutaneous and Genito-urinary Diseases*, vol. ix., No. 11) records two cases of this rare condition, and adds four cases collected from medical literature. Unfortunately, the diagnosis is obscure, and it does not seem possible to do much in the way of relief of the condition.

The first case seen by the writer was that of a man twenty-one years of age. He had had gonorrhœa, lasting a few weeks, a year before coming under observation. A week before presenting himself he attended a boat-race, and

on returning home he had a chill, after which the urine was much diminished in quantity. At the end of sixty hours a tumor was seen in the left hypochondrium, extending backward toward the kidney, and being apparently connected with it. This was aspirated at the end of the third day through the abdominal wall and a large quantity of urine of low specific gravity withdrawn. In twelve hours the tumor had refilled. The patient was distinctly uræmic.

A lumbar nephrotomy was performed. On opening the kidney a large quantity of urine gushed out and the finger entered a very large cavity. The ureter was explored for some distance by a sound, but no obstruction found. The patient died forty-eight hours after operation, in uræmic coma.

The autopsy showed that the right kidney was transformed into a big sac, lined with pyogenic membrane, all the parenchyma of the kidney being destroyed. The ureter, one inch below its exit from the pelvis, was the seat of a dense deposit of connective tissue, probably resulting from chronic inflammation. The constriction would barely admit a fine probe. The left kidney was the seat of an extensive hydronephrosis, and the ureter widely dilated to within an inch and a half of the bladder, at which point was a similar connective-tissue deposit to that described in the right ureter. There was a doubtful history of the passage of a renal calculus eight months before death.

The second case was a male, aged thirty-eight years. For eight or ten years the patient had had occasional pain in the right renal region. The urine contained pus, and at times small blood-clots. Two pea-sized calculi were passed without any pain at the time or preceding. The patient began to suffer from great irritability of the bladder, for which drainage was advised, and accordingly the membranous urethra was opened and a large tube introduced. The patient did well for a week, when epididymitis developed on the left side, followed the next day by hiccough and vomiting, and death on the eleventh day.

At the autopsy the left ureter was found obliterated by dense connective tissue at a point two inches above the bladder. Above this point the ureter was widely dilated, and the kidney was simply a thick-walled sac. The right ureter was dilated from the bladder to within one-half inch of the kidney. At this point it was bent upon itself, and was so narrowed by connective-tissue growth as to only admit a large steel knitting-needle. Pyelo-nephritis was present.

The histories and symptoms in the four cases collected were much the same as those described, except one, in which suppression of urine and polyuria alternated for some time before death. All the cases proved fatal. In one case the condition of but one kidney is noted. In the other five, both kidneys were more or less seriously disorganized.

Oblique Osteotomy of the Femur.

Terrier and Hennequin (*Revue d'Orthopédie*, No. 1, 1892) describe a new operation in the following case: Suppurating left sided coxalgia; luxation of the more or less altered head of the femur into the external iliac fossa, where it had formed firm adhesions; arrest in development of iliac bones and bones of the entire extremity; atrophy of the muscles of the

pelvis and of the extremity; enlargement of the great trochanter; slight genu valgus. A six-inch incision was made from the middle of the anterior surface of the great trochanter down the anterior surface of the femur, dividing all tissues to the periosteum. This was laid bare and a four and one-half inch incision was made from the external aspect of the great trochanter obliquely across the femur to its inner aspect; the periosteum was raised, and the femur divided by an osteotome in a plane at an angle of 40° with the antero-posterior plane of the thigh. In order not to injure the neighboring arteries anteriorly and internally, the leg was flexed upon the thigh and used to rotate the lower portion. The inferior fragment was seen to pass posteriorly to the superior, and from being external became postero-internal. This corrected simultaneously the adduction and internal rotation. The wound and upper thigh were dressed antiseptically; the lower thigh and leg were padded with ordinary wadding and bandage, over which a handkerchief-bandage was placed in figure-of-eight, the upper circle surrounding the thigh in its upper fourth, while the lower reached the posterior surface of the leg at the junction of its middle and upper thirds; at this point was attached the ordinary extension cord, with weights increasing from six to twelve pounds; the whole was placed in a padded splint and held in slight abduction and rotation. The patient made a good recovery, motion under traction being used to produce a movable joint, and upon removal of the splints showed a lengthening of 2.7 inches, leaving a difference of only 0.8 of an inch between the limbs. The new joint was movable, allowing an angle of less than a right angle between the femur and pelvis without difficulty, pain, or crepitation, and the patient could walk with foot flat on the ground for half an hour at a time.

The special points of the operation are: the obliquity of the incision, the lengthening of the femur, and the formation of a movable, useful new joint, which is the most instructive and interesting feature, and was accomplished by the oblique incision and gymnastics under traction.

BROCA (*Ibid.*) reports the following case with equally gratifying results from the same operation. The patient's left leg was five inches shorter than the right. Flexion was very pronounced, it being necessary to flex the thigh to a right angle with the pelvis to destroy the lumbar curvature. Adduction was also pronounced, the left knee lying to the right of the median line of the body. After operation, by the method described above, the difference in length was but 0.7 inch, measured from iliac spines to internal malleoli; the adduction had entirely disappeared, the toes pointed slightly outward, and the angle of the femur with the back lying flat was 150°.

SCHWARTZ (*Ibid.*) reports two cases of subtrochanteric osteotomy. Case 1: Patient, aged nine and a half years; suppurating left-sided coxalgia with luxation of the head of the femur into the external iliac fossa, where it was immobile; angle less than a right angle necessary between femur and pelvis, to correct lumbar curvature; adduction marked, with external rotation; shortening 4.7 inches. After oblique subtrochanteric osteotomy, the limbs were parallel; slight external rotation; no flexion; shortening 2 inches. Case 2: Male, aged twenty-seven; right-sided ilio-femoral arthritis, with ankylosis after blennorrhagia and gonococcic infection. Flexion was slight; adduction marked; obliteration of the gluteo-femoral fold; and atrophy of the

limb, especially the thigh and leg. Cuneiform subtrochanteric osteotomy of femur was followed by recovery in good position.

A Case of Hydatid of the Femur.

Mr. Webb (*Australian Medical Journal*, vol. xiii., No. 11) reports the following case: Patient, male, aged twenty-six, was said to be suffering from sarcoma of the femur. Five months previously he had had typhoid fever, and on recovery he had severe nocturnal pains over the trochanter of the left femur; the leg began to swell, and a localized well-defined tumor was found over the seat of pain. This tumor was still easily seen, although the swelling had subsided, and the left thigh was no larger than the right. The tumor was the size of half an orange, tender, hard, and without distinct fluctuation. Malignant disease was excluded by the absence of late increase in the size of the tumor and the undilated condition of the veins; its size excluded periosteal tumors, and it seemed therefore probable that it was an abscess, although the fluctuation was indistinct. After anæthesia, an incision was made in the tumor, when hydatid cysts escaped and the nature of the tumor was evident. The whole trochanter and four inches of the shaft had become detached; the only connection remaining between the head of the bone and the shaft was a thin shell of bone. About two or three hundred cysts escaped, but there was no mother cyst, the usual condition in bony cysts. The obscure fluctuation was due to extravasated fluid beneath the periosteum. With antiseptic dressing the patient was making a good recovery, and was gaining in weight and appetite.

Vascular Tumor of the Urethra.

McMordie (*Medical Press and Circular*, vol. lii., No. 2746) records a vascular tumor near the neck of the bladder, causing pain and retention of urine. The patient, a married woman, aged fifty-four, had suffered for eight months from frequent and painful micturition, with uncontrollable desire to repeat the act every five minutes; there was also weakness, loss of flesh, and sleeplessness. Ten ounces of urine were drawn off, and a tumor detected by the catheter. Under anæsthesia the urethra was dilated by a three-bladed dilator sufficiently to admit the passage of a finger, and a vascular tumor was found near the neck of the bladder and easily removed. Pressure was applied by plugging the vagina, and the urine drawn at intervals by a catheter. The patient made a good recovery.

Intra-glandular Enucleation of Goitrous Nodules by the Bloodless Method.

Poppert contributes an interesting article (*Deutsche med. Wochenschr.*, 1891, No. 52) on the surgical treatment of thyroid enlargements, in which the operation proposed by Socin is strongly advocated. The latter writer has pointed out the frequent existence of the nodular form of thyroid enlargement, and has laid down a definite method of dealing with circumscribed solid and cystic growths. Hyperplasia of the gland is likewise apt to be local rather than general. The nodules may be single or multiple; they are

usually round tumors with smooth surfaces. The surrounding gland-tissue is unchanged, being simply pushed aside. For such cases Socin's enucleation is the most rational of all operative procedures. The objection that it does not prevent recurrence holds for all other methods of treatment, while it has the great advantage of removing only the degenerated tissue, while the healthy gland substance is not interfered with. Although the operation is not without the possibility of danger and difficulties, it is conceded to be usually very easy; hemorrhage is insignificant, and the time required is short. Hemorrhage may be considerable if the operator passes out into the soft glandular tissue, or if the masses lie deeply imbedded in the gland, requiring incision through its substance, or when adhesions exist. The use of the elastic ligature has rendered the operation practically bloodless.

The method of Bose is as follows: An incision is made over the enlarged half of the gland, and the loose tissues overlying the capsule of the gland separated by blunt dissection, so that the tumor in its largest diameter may be taken out of the wound. An elastic ligature is applied about the base of the tumor, which means beyond the largest diameter. Free incisions may now be employed without hemorrhage resulting, and any nodules are removed. After removing the ligature the gland is compressed for a short time, or, if necessary, small vessels may be ligated.

Of 20 cases coming under the writer's observation in the last two and one-half years, 16 were examples of nodular or cystic growths and 4 of total degeneration of the gland. The recognition of a distended cystic tumor is, as a rule, easy, but if multiple nodules are present it becomes difficult to tell which form of the disease is present.

The operations in the above 16 cases are detailed, and from these it is argued that the method of ligature in cases of partial hyperplasia was entirely feasible, as well as the removal of the new-growth. In opposition to this it was found that the diffuse form of the disease was much more difficult to deal with. It is much less movable, is firmer, more adherent to surrounding tissues, and the removal requires much more time.

If the enlargement is in the middle line—in the isthmus—the ligature of the pedicle is difficult, and is apt to slip. In these cases it is well to make the incision as for semi-lateral extirpation of the gland, and to lift with the nodule the half of the gland, and to pass the ligature around this. In some cases the rubber tube caused some difficulty in respiration, if narcosis was not complete, and occasionally it was necessary to remove the ligature until anæsthesia was produced again. The ligature must not be applied too close to the trachea. Cysts may be removed as easily as nodules. It is recommended to make a circular incision around the cyst, and so enucleate without rupturing its wall.

The author believes that in circumscribed growths, in the future, the only operation that will be admissible will be the bloodless intra-glandular method. The operation can be easily and quickly done, and hemorrhage is usually slight. If the remaining gland is hypertrophied, hemorrhage is more apt to occur after removal of the ligature, and when present is controlled by passing deep as well as superficial sutures.

The Treatment of Strictures due to Incomplete Rupture of the Perineal Urethra.

Guyon, in a clinical lecture at the Hôpital Necker (*Le Mercredi Médical*, 1891, No. 51), spoke of strictures following incomplete rupture of the deep urethra, and exhibited five cases.

These cases are characterized by rapid formation of the stricture, with a persistent tendency to recurrence. The contractile power of the new tissue is never entirely overcome.

In case of complete rupture of the urethra, the rule is to incise the perineum at once, without making any attempt at catheterization, and to join the two ends of the urethra after having passed a sound. Guyon has been a strong advocate of this true surgical principle, and advises in addition the immediate sewing of the ends of the urethra, if they are not too irregular. If the ends are not sufficiently even they may be resected.

This treatment would probably be satisfactory in cases of partial rupture of the urethra, if done at once; but when one is compelled to operate for conditions due to lesions already formed it is better to remove the cicatricial constriction by partial resection of the urethra. The results, both primary and remote, are satisfactory in the highest degree, the more so when compared with other plans of treatment, including external urethrotomy.

The object of the resection of the urethra is to remove the hard, thick, and retractile cicatrix and to obtain linear union, with the result of a smooth scar. Total primary union is frequently obtained—even more frequently than could be expected—and uninterrupted healing takes place in spite of slight contamination by urine. [See American Journal of the Medical Sciences, March, 1892, p. 331.—J. W. W.]

Tumor of the Brain; Autopsy.

Bull (*New York Med. Journ.*, vol. lv., No. 2) reports the case of a man, aged forty-five, who consulted him in April, 1890, on account of inequality of the pupils, which had then existed about a year. He also complained of ill defined brain and nerve symptoms, which were believed to be *petit mal*.

On examination, there was found to be marked ptosis of the right upper eyelid and paresis of both internal recti. The left pupil was more than twice the diameter of the right. There was crossed diplopia. R., $\frac{3}{cc}$; L., $\frac{5}{cc}$. The right eye was the seat of a moderate neuro-retinitis, with two or three small hemorrhages in the retina near the margin of the disc. The field of vision was normal and color-sense unchanged.

Under iodide of potassium and mercury the neuro-retinitis and muscular paresis disappeared.

Later, attacks of vertigo were noticed, and these gradually grew in intensity; the left side became anæsthetic, and well-marked epileptiform convulsions developed. The condition of the patient remained unchanged until January 28, 1891. The patient had retired in his usual health, and was awakened about 2 o'clock in the morning with violent pain in the occipital

region. He soon became delirious, coma followed, and he died at 11 A.M. This was the first time pain in the head was complained of.

The autopsy was made the same afternoon. The dura was thickened and adherent to the skull; the convolutions were flattened. The anterior half of left hemisphere was larger than the right. Section through the left frontal lobe disclosed a tumor two inches in longitudinal diameter and an inch and three-quarters in transverse diameter, with a broken-down centre. The anterior portion was firmer than the brain substance; was grayish-pink in color, with a few small hemorrhagic spots. The growth reached to within two inches of the anterior extremity of the hemisphere. The tumor involved the corpus callosum, and protruded downward from the roof of the left lateral ventricle. Microscopical examination proved it to be a glio-sarcoma.

Peri-urethral Abscess due to Gonococci.

Christiani (*Revue Médicale de la Suisse Romande*, 1891, No. 10) contributes further knowledge on the pyogenic properties of the gonococcus of Neisser.

Since the discovery of this coccus in blennorrhagic discharges it has been sought for in all the series of affections which are observed as complications of gonorrhœa. It has been found in pyosalpinx following blennorrhagia, in suppurating arthritis consecutive to gonorrhœal conjunctivitis in an infant, in Bartholinitis, in suppurating adenitis following gonorrhœa, and in epididymitis.

In other cases—blennorrhagic endocarditis, for instance—streptococci have been found instead of gonococci, and in cases of arthritis and hydrocele due to gonorrhœa no bacteria have been found.

Some authors affirm that the gonococcus is never found alone, but always in conjunction with other species, especially pyogenic staphylococci. Pellizzari, in three peri-urethral abscesses, found only the gonococci, and this observer believes that the gonococcus can cause suppuration, and that in those cases in which other cocci are found the latter gain access to the seat of suppuration after it is established by the former.

Wertheim demonstrated the phlogistic action of the gonococcus on the peritoneum of animals, peritonitis resulting.

The gonococci are mostly found in the pus corpuscles, but a certain number are outside of the cells. This coccus is generally seen as a diplococcus—in pairs; it stains readily with anilin, and can be discolored by Gram's method; these are its main distinguishing features. Cultures have been attempted, but without success.

The conclusion of the writer is, therefore, that the gonococcus of Neisser has pyogenic properties analogous to those of staphylococci and streptococci. This is not especially to be wondered at, as it has been found that the typhoid bacillus and the pneumococcus, as well as others, are capable of causing abscesses, and the action of the gonococcus on the mucous membranes results in a kind of suppuration.

[The rapidly increasing evidence as to the definite relation between the gonococcus and gonorrhœa is strengthened by the discovery of this microorganism in the majority of the complications. It must not be forgotten, however, that demonstrative proof is still wanting. Neither gonorrhœa nor

any of the diseases above mentioned has yet been produced by inoculation of pure cultures of the gonococcus. The circumstantial evidence of its etiological relation to gonorrhœa is unmistakable, but the majority of cases of the latter disease are instances of mixed infection, the ordinary microbes of suppuration being usually present.—J. W. W.]

DERMATOLOGY.

UNDER THE CHARGE OF

LOUIS A. DUHRING, M.D.,

PROFESSOR OF DERMATOLOGY IN THE UNIVERSITY OF PENNSYLVANIA.

NÆVI.

HALLOPEAU (*Le Progrès Médical*, No. 28, 1891) considers that the old division of nævi into pigmentary and vascular is too narrow in scope, and that the term should include all those benign neoplasms of an embryonal nature, as has been recently suggested by Pollitzer. The following division is made: 1. Nævi due to the proliferation of distinguishable elements, as, *a*, smooth, pigmented nævi, nævi spili; *b*, hairy nævi; *c*, kerato-hairy nævi (with proliferation of the sheaths of the hair-follicles; *d*, molluscoid nævi, molluscum fibrosum, seborrhœic warts with proliferation of the connective tissue, *e*, nævus molluscum lipomatodes (with proliferation of fat; *f*, verrucous nævi (with proliferation of papillæ; *g*, sebaceous adenomata nævi; *h*, sudoriparous adenomata nævi; *i*, corneous nævi of the sudoriparous orifices; *j*, kerato-dermic nævi (partial ichthyoses); *k*, vascular nævi, flat and tuberous; *l*, lymphangiomata. 2. Nævi due to proliferation of non-distinguishable elements, as epithelial cellulomata, hydro-adenomata, syringo-cystadenomata. 3. Mixed nævi.

Kerato-pilous nævus is illustrated with a drawing showing the affection involving the region of the forearm and hand supplied by the distribution of the cubital nerve. It presents the characters usually attributed to keratosis pilaris. Molluscum fibrosum is regarded as a nævus because it is often congenital, and frequently occurs together with nævi, as well as upon other nævi. The nævoid nature of certain of the sebaceous adenomata has been recently established by Pringle, and the sudoriparous adenoma described by Perry is likewise of similar origin. The case of kerato-dermia localized at the orifices of sudoriparous glands, occurring in linear course, as published by Hallopeau and Claisse, must also be grouped here. The appearance in the early period of life of certain palmar and plantar kerato-dermias must be considered as nævoid in character. In classifying here lymphangioma circumscriptum, the author is supported by Török, who attributes these lesions as due to a congenital defect of development.

The same may be said concerning the tumors called epithelial cellulomata, hydro-adenomata, and syringo-cystadenomata, which are congenital, and are

reported by Török, Jacquet, and Quinquaud to be due to an abnormal development of embryonal germs. The mixed nævi comprise the verrucous and hairy, the molluscoid and vascular, and the like. Several drawings showing the localization of the lesions accompany the article, and are of interest, especially that illustrating the kerato-dermic nævus of the orifices of the sudoriparous glands situated on the sole of the foot.

Alkalies in Universal Pruritus.

C. Lange, of Copenhagen (*Journal of Cutaneous and Genito-urinary Diseases*, 1891) has obtained prompt and favorable action from sodium bicarbonate combined with lithium carbonate in four cases, in all of which the usual remedies had failed. The pruritus in one case, a lady aged fifty-one, had localized itself in the genital region, and was exceedingly severe. In the urine of two other patients an abundant precipitate of uric acid and urates was found.

Two Cases of Dermatitis Herpetiformis Developing after Severe Mental Emotion and Shock.

George T. Elliott (*Journal of Cutaneous and Genito-urinary Diseases*, 1891) reports two cases of this disease, one occurring in a woman, the other in a man, resulting from nervous shock from death in the family, both patients having been at the time in a state of mental depression. The disease in both instances was of an aggravated type, characterized by erythematous, papular and vesicular lesions, with pain, burning and itching. Recurrences of the disease seemed to be brought on by anxiety and mental worry, to which the patients were from time to time subjected. The author refers to ten cases in the literature of the subject where the disease was traced to the same set of causes, and believes that the affection should be regarded as a dermato-neurosis.

Pigmentary Syphilodermata.

Fiveisky, of Moscow (*Annales de Derm. et de Syph.*, 1891, No. 5) has studied this subject for some years upon the prostitutes of the hospital Miasnitzkaïa, with the following conclusions: They occur during the secondary period, and occupy by preference the neck and sometimes other parts of the body, with the exception of the face, scalp, the internal face of the nipples, the region of the buttocks, and the forearm. 2. The leucoderma of this form is always syphilitic. 3. Sometimes it coexists with gummata. 4. They occupy ordinarily a region plainly in sight (the neck), the diagnosis being easy, and their duration of several years may be regarded as one of the most significant signs of the secondary period. 5. They occur most frequently upon women, but generalized forms are more frequent in men. 6. They last usually from one to seven years. 7. They are not amenable in a sensible manner to either mercury or the iodides, but are more marked where mercurial treatment has not been employed. 8. They appear under three forms, marbled, spotted, and retiform.

A New Variety of Tropho-neurosis of the Skin.

MM. Hallopeau and Larat (*La Semaine Médicale*, 1891, No. 47) describes a condition of the skin characterized by dyschromia and lichenoid eruption. Reference is made to the various dyschromias due to nervous origin which have been described by authors, and to the concomitant phenomena, consisting of disturbances of sensibility and of the vascular system, and disorders of secretion; to which may be added, as shown by a case of the author's, impaired nutrition of the hairs. A case recently observed shows that lichenoid papules may also be produced by the same causes. They make a résumé of their observations as follows: There exists a dermatosis characterized by achromatous patches surrounded by a papular border and by increased pigmentation. This dermatosis is probably a cutaneous manifestation of hysteria. The papules, lichenoid in kind, may be of a tropho-neurotic origin. They are not necessarily akin to pruritus. Cutaneous electrization in the form of bath, with the faradic current, seems to be indicated.

On a General Infectious Complication in Lupus Vulgaris.

V. Lespinne (*Le Mercredi Médical*, 1891, No. 35) believes that there may be produced in the course of the evolution of lupus a special general complication due to absorption of toxic microbes taking place from the surface of the ulcer, this poisoning announcing itself by a sharp increase of temperature, with typhoidal state, catarrhal phenomena of the mucous membranes, and even symptoms of the serous membranes. This complication may be the signal for the period of invasion of the whole organism, general tuberculosis taking the place of the local tuberculosis of the skin.

Medicated Soaps.

A. Santi, of Bern (*Correspondenzbl. für Schweizer Aerzte*, No. 13, xxi. Jahrg. 1891) speaks in praise of medicated soaps, which, within the last few years, since they have been manufactured (especially abroad) to suit the requirements of the physician, have come into good repute. Soaps easily penetrate the epidermis, hence drugs are more active in this form than in ointments. The method is cleanly, cheap, and more agreeable to the patient than that of ointments. The soaps manufactured according to the formula of Unna are first considered. The soap-mass, in the first place, reacts absolutely neutral, and is composed of the best beef tallow and freshly prepared soda and potash lye, two or three (in summer) parts soda to one of potash, which latter acts more effectively than soda on the horny layer of the epidermis. To obviate the drying effect of even neutral soap on the skin the soaps are all superfatted with about four per cent. free fat, for which purpose olive oil is used. The following soaps in cake form are mentioned. They contain marble, ichthyol, salicylic acid, zinc oxide and salicylic acid, tannin, tannate of soda, oxide of zinc and tannate of soda, zinc tannate, rhubarb, tar, sulphur, tar-sulphur, camphor, camphor-sulphur, iodide of potassium, soda, and naphthol-sulphur.

A superfatted potash soft soap has also been made by Unna and Micek,

which occupies a position midway between ointments and soaps, and is designated sapo unguinosus. Of these medicated soaps may be mentioned sapo cinereus unguinosus, useful for the introduction of mercury into the system by inunction, and sapo unguinosus ichthyolatus. A desirable corrosive sublimate soap has been produced by Geissler, of Dresden.

Eichhoff has prepared a series of superfatted soaps, the principles of manufacture being much the same as those of Unna and Micek. The list comprises resorcin-salicylic, resorcin-salicylic-sulphur, resorcin-salicylic-sulphur-tar, quinia, hydroxylamin, iodoform, creolin, ergotin, iodine, and salicylic-creasote.

As an advance of great worth in soap therapy there remain to be mentioned the fluid soaps introduced by Buzzi, of Lugano, and manufactured by Keysser, of Hanover. A neutral soap basis is first made, which is either superfatted with lanolin or made alkaline by carbonate of potash (one per cent. or more). A list of fifty different soaps is presented, some being neutral, others alkaline and superfatted. There are some advantages in these fluid soaps over the harder soaps, and the author commends them as being decidedly useful.

Mineral Water in Skin Diseases.

F. Cerasi (*Journal of Cutaneous and Genito-urinary Diseases*, 1891, from *Gazetta Med. di Roma*) speaks of the value of Ceresole Reale water in some skin diseases, especially in those due to nervous disturbances. The water is ferruginous, acidulous, slightly alkaline, and contains a small amount of arseniate of soda. It is much used in England, Egypt, Switzerland, and Northern Italy, the spring being favorably situated in the last-named country between Piedmont and Savoy. Its virtues are considered by the author and by others to be due to the presence of the arsenic, but toxic symptoms are never encountered from its use. It acts as a nervine tonic. The average dose is one bottle taken before meals, and continued for one or two months. The general health usually improves. Several cases of cure of obstinate cutaneous disease are reported.

Treatment of Eczema.

Veiel, of Cannstatt (*La Semaine Medicale*, 1891, No. 47) discussed this subject before the recent Congress of German Dermatologists. In the first place, he does not think that every case of eczema is curable—especially is this true of hereditary cases. A second question to decide is whether internal treatment is demanded or not, and as there are no specifics against eczema he is of the opinion that internal medication is useless unless there are complications. In acute weeping eczema the dusting powders are recommended, and for the more persistent forms Lassar's paste and Pick's salicylic soap. When the eczema is in a squamous state a five per cent. tannic acid ointment is useful; and when chronic, the treatment of Pick with the gelatin sublimate and the plaster of salicylic soap give the best results. The salicylic rubber plasters of Unna are excellent in eczema of the palms and soles, but active irritation should be guarded against. The weeping eczemas of the scalp dry quickly under a salicylic ointment of ten per cent. strength; or if this be not

successful tar may be used, a remedy which as yet has not been supplanted by any as valuable. It is very difficult to know when to employ tar; the skin should be taught to tolerate it. We should use it only upon dry eczema, but nevertheless there are some cases of weeping eczema of the face which yield to it. The mildest form is tar soap. The alcoholic solutions of tar also act rapidly, although oil of cade is preferred. If there is much infiltration, chrysarobin ointment and pyrogallol ointment, the former two per cent. strength increased, if possible, even to ten per cent. Sulphur is seldom employed by the author except for seborrhœic eczema and eczema of the beard.

Chaulmoogra Oil in the Treatment of Leprosy.

Bergé (*New Orleans Medical and Surgical Journal*, 1891) extols this remedy, and gives the notes of three cases in which it was employed with great benefit. The results seem remarkable. The dosage was ten drops of the oil in a spoonful of water three times daily, gradually increased until forty-five drops three times daily were taken without disturbance of the alimentary canal, except in large doses, when the bowels were liable to be acted upon too violently. The author thinks the oil should be regarded as a specific. Its absorptive properties were manifested in a striking degree upon the tubercular infiltrations; it afforded relief to the nervous phenomena, relieved the anæsthesia, and restored health to the body and mind. Reliance seems to have been placed upon its internal administration, for it is stated that "the remedial properties of the oil externally have not been fully tested," and the author refrains from speaking about this question. [This experience is at variance with that of Unna and Brooke, who regard the oil as of no value unless taken in large and continuous doses, which most patients are not able to tolerate.—Ed.]

Treatment of Lupus Erythematosus of Eyelids and Face.

Brocq (*British Journal of Dermatology*, 1891) recommends in this disease:

℞.—Salicylic acid	℥ss
Lactic acid	℥ss
Resorcin	gr. xlv
Zinc oxide	℥ij
Vaselin	℥xvij

The following is also usually well borne:

℞.—Salicylic acid	1 part
Pyrogallol	2 parts
Vaselin	20 parts

This is to be rubbed in at night. During the day the first named may be applied, the two being thus used conjointly.

Herpes Menstrualis.

Bergh, of Copenhagen (*Journ. de Mal. Cut. et Syph.*, 1891, No. 6) from his personal experience at the Vestre Hospital during a period of twenty-three

years, concludes that herpes often follows menstruation. In 877 cases of genital herpes, the affection was observed to follow menstruation in 644 cases (73.11 per cent.) and occurring on the labia majora in 80 per cent. The nervous origin of genital herpes is very probable. The herpes is not a deviation of the menstruation, as some authors think; no more is it a result of local irritation due to coitus, without the intervention of the nervous system, as Fournier and Kaposi believe, for relapsing genital herpes appears often upon the face in place of showing itself upon the genital regions. Herpes progenitalis is very commonly observed upon prostitutes.

Treatment of Alopecia Areata, with Cases.

P. A. Morrow (*Journal of Cutaneous and Genito-urinary Diseases*, 1891), after an interesting discussion as to the nature of the disease, takes up the subject of treatment. In all cases where there is loss of nerve tone, phosphide of zinc and strychnine, a combination of phosphorous iron and strychnine, or phosphoric acid and strychnine, are relied on. The local treatment which has afforded the best results consists in the following: The hair around the border of each patch is to be clipped closely, permitting a more thorough inspection of the diseased area and facilitating the application of remedies. The hairs around the borders of the patches are depilated where loose. In recent cases chrysarobin, with or without the addition of salicylic acid, in traumaticin or in the form of an ointment, eight to ten per cent. of chrysarobin and two to five of salicylic acid, is prescribed. Applied every few days, a moderate dermatitis is excited and maintained. This treatment is often sufficient to effect a cure. Where the disease is severe and extensive, involving the greater part of the scalp, the entire suface should be treated with acetic acid, mixed with chloroform or ether, the amount of acetic acid being graduated to meet the requirements of the case, ordinarily a strength sufficient to produce the white nitrate of silver tint being employed. The superficial vesiculation is followed by slight exfoliation of the epidermis. Besnier's formula—chloral hydrate 5 grammes, officinal ether 25 grammes, acetic acid (crystals) 1 to 5 grammes—is commended. These applications are repeated two or three times a week at first, and continued at longer intervals during the entire treatment. Between the time of these applications a stimulating oil, as the following, is employed: oil of eucalyptus, oil of turpentine, each half an ounce, crude petroleum one ounce, alcohol one ounce, to be well rubbed in by massage. Once a week or oftener the scalp should be cleaned with tincture of green soap and water. At a later stage of the disease the oil may be replaced by a sulphur and resorcin ointment. Daily douches and frictions with salt and water also favorably influence the growth of the hair.

Psoriasis a Neurosis.

Prof. Polotebnoff, of St. Petersburg (*Monatshefte für prakt. Dermat.*, 1891, Ergänzungsheft I.) expresses the view that this disease is the result of nervous disturbances of various kinds, and hence that it is a neurosis of the skin. The author disputes the usual opinion that patients with psoriasis are gener-

ally otherwise in good health. A large number of cases are recorded in which the skin disease was accompanied by nervous and psychical symptoms, some of which are of such interest and so striking as to be worthy of quotation. The following are selected. Psoriasis when not stated is implied.

CASE I.—Lawyer, aged twenty-four; severe headache, nervousness, great impairment of mental faculties, hysterical attack in witnessing a theatrical performance.

CASE II.—Naval officer, aged twenty-four; intense melancholia; sent South for change of air, when psoriasis healed spontaneously; relapse of skin disease after protracted headaches; hysterical attacks. His whole family of nervous temperament.

CASE III.—Jewess, aged twenty; father an epileptic, mother suffered from megrim; patient hysterical and nervous; psoriasis appeared after intense mental strain on changing her religion to marry a Christian.

CASE IV.—Girl, aged sixteen; grandfather insane; constant vertigo; least excitement causes enuresis; weeps if not given her favorite teacup at the table.

CASE V.—Medical man, aged forty; father had psoriasis; patient considers himself very nervous; sheds tears copiously before strangers when referring to the death of his two children from diphtheria.

CASE VI.—Married woman, aged twenty-seven; hysterical convulsions; hallucinations of hearing and vision.

CASE VII.—Engineer, powerfully built, and in apparently robust health; three relapses of psoriasis; fourth, fifth, and sixth dorsal vertebræ sensitive to touch, slight pressure producing reflex contractions of the muscles of the back and upper extremities; knee reflexes marked; increased temperature on right side; had had measles, scarlatina, typhoid fever, and malaria; psoriasis worst in spring, when he was preparing for his examinations.

CASE VIII.—Boy, aged sixteen; father has nervous debility, brother melancholic; mental abnormalities; aural hallucinations, and simultaneously psoriasis.

A second group of cases is recorded in which diseases of the joints and bones, with and without nervous symptoms, were present with the psoriasis, as in the following:

CASE IX.—Horse-trainer, aged forty-eight, powerfully built; had repeatedly received severe injuries, especially of the head; fingers and toes showed remarkable deformities; eruption coincided with a period of intense nervous excitability, improvement taking place immediately upon his receiving an increase in wages.

The disease is also referred to in connection with certain fevers, as typhus and typhoid, and as a result of alcoholism, as this case will show:

CASE X.—Waiter, aged thirty-three, small stature, hard drinker; had had measles, typhoid fever, and syphilis, and had received an injury to the head. When abstaining from drink is free of psoriasis.

Still another group of cases is presented in which nerve changes are found on special examination. Here there exist vasomotor and functional neuroses, in connection with the head, bloodvessels, temperature, and glands. Weakness of the nervous system is considered by the author to be the main factor

in the production of the disease. Albuminuria seemed to be a cause in three cases, this condition and the eruption disappearing simultaneously.

Where the symptoms are acute the bromides are recommended, and later arsenic, which, as is well known, is attracted to nerve tissue. In this connection reference is made to Skolobusow's investigations in acute and chronic poisoning with arsenic. This observer found in the brain and in medulla thirty times as much of the drug as in the liver and muscles. Lesser's studies gave similar results. Polotebnoff states that the dose should be large, increased to as much as a half-grain or more of arsenious acid daily for a week or two. The usual local remedies are recommended.

Vascular Territory of the Human Skin.

Spaltebolz, of Leipzig (*La Semaine Médical*, 1891, No. 47), gives these results of his studies upon injected tissues: 1. The number of afferent branches and their diameter is variable; where pressure is brought to bear they are more numerous and larger. 2. Their length is greater where the skin is very mobile. 3. There exist multiple anastomoses, the arteries of the skin never ending as terminal arteries. 4. The size and the number of the anastomoses are always different, being largest and most numerous where there is increased pressure.

Thiol in Skin Diseases.

Buzzi's (*Charité Annalen*, 1891, Band xv.) experiments in Professor Schweninger's clinic in Berlin lead him to regard thiol as superior to ichthyol. It is valuable in many diseases of the skin, and possesses the following advantages over ichthyol: it is clean and never irritates, whereas ichthyol is impure and often irritates; ichthyol smells disagreeably, thiol does not; ichthyol spots the linen, thiol does not. It moreover has the advantage of costing only one-half as much as ichthyol.

Strophulus Infantum.

Gebert (*Archiv für Kinderheilkunde*, 1891, Bd. xiii., Heft 3), with this title considers urticaria papulosa, or the lichen urticatus of older authors, and is of the opinion that hot baths, frequently repeated, act in producing the eruption. As the patients are often anæmic, iron is found useful, and for the itching small doses of antipyrine at night. The body should be sponged with dilute and cold vinegar at bedtime.

Acid Nitrate of Mercury as a Caustic.

Hutchinson (*Archives of Surgery*, 1891) speaks highly of this remedy as an application in nearly all unhealthy looking sores, and wherever an infective process seems likely to involve other parts. It is thus useful in boils, lupus, late syphilitic disease of skin or mucous membrane, and in phagedena. It should be cautiously applied with glass brushes of various sizes, any superfluity being taken up with thick blotting-paper to avoid scar-formation.

Angio-keratoma.

Dr. Pringle, of London (*Brit. Journ. of Dermat.*, 1891), with this title describes a rare skin disease, always a sequela of chilblains, occurring in early adult life, characterized by small grouped areas of telangiectases occurring on the hands and feet. Later, the lesions may attain the size of a pea, and become rough, hard, and warty, owing to the thickened epidermis. The disease bears most resemblance to lymphangioma circumscriptum. Electrolysis with the needle proved successful in one case.

OBSTETRICS.

UNDER THE CHARGE OF

EDWARD P. DAVIS, A.M., M.D.,

PROFESSOR OF OBSTETRICS AND DISEASES OF CHILDREN IN THE PHILADELPHIA POLYCLINIC;
CLINICAL LECTURER ON OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE;
VISITING OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL, ETC.

Myoma of the Uterus Complicating Labor.

In the *Berliner klinische Wochenschrift*, 1892, No. 6) Hueter, of Marburg, reviews the manner in which myomata of the uterus may complicate labor. He finds that they are a frequent cause of abortion and of profuse uterine hemorrhage during pregnancy, especially when accompanied by placenta prævia. The functions of the bladder and rectum are also much interfered with during pregnancy in patients suffering from myomata. The growth of these tumors is often very rapid during the pregnant state, resulting in interference with the circulation, and œdema of the lower extremities. The position of the uterus is rendered abnormal, so that unfavorable positions of the child, prolapse of the extremities and of the cord are frequently observed. The uterine contractions are rendered abnormal during labor. The expulsion of the fœtus is indefinitely prolonged, and fœtal death and dangers to the mother constantly arise. When the tumor is so low that it is situated in the pelvis it obstructs labor, and the case resembles one of contracted pelvis. Myomata situated beneath the mucous membrane of the uterus are often dislocated during labor, permitting the escape of the child, and in some instances a spontaneous expulsion of the tumor. In cases complicated by large myomata rupture of the uterus has been observed. The fœtus is often subjected to bruising and fractures similar to those observed in contracted pelves. The stage of placental expulsion is often characterized by such profuse hemorrhage as to endanger the mother's life. The puerperal period in these cases is frequently complicated by septic infection and other abnormalities.

Reviewing a series of 147 cases collected by Süsserott it was observed that 60 per cent. of the labors were terminated instrumentally. A series of 8 cases of pregnancy complicated by myomata were treated by Stratz by instru-

mental measures; none of the mothers died. In 13 cases in which labor terminated spontaneously, 54 per cent. of the mothers perished and 40 per cent. of the children.

The case reported by Hueter was that of a multigravida in her fifth pregnancy at the ninth month. Uterine contractions were very weak, and the early stages of labor lasted for fourteen days. A few days before Hueter's arrival the membranes ruptured, followed by slight persistent hemorrhage from the uterus. On examination, the uterus was the seat of a very large tumor. The child lay upon the left side of the womb, the right portion being occupied by the tumor. It was difficult to introduce the finger into the uterus as the os was nearly filled by a firm mass. The cord had prolapsed and ceased to pulsate. After anæsthetizing the patient, it was possible by gentle manipulation to introduce the hand into the uterus. Version was cautiously performed and a macerated child was delivered. The cord was ruptured during the extraction. The hand introduced within the womb after the birth of the child found a portion of the tumor projecting into the os and cervix. An attempt was made to remove this portion with the hand, which proved successful; other portions then presented, and as no hemorrhage accompanied the manipulation they were successively removed by the hand. A large portion of the tumor was thus delivered, leaving the uterine wall upon the right side very much thinned. The placenta was taken away and the uterus washed out with three per cent. solution of carbolic acid. The patient made an uninterrupted convalescence. The myoma had been submucous, and the remarkable lack of hemorrhage accompanying its removal was explained by the fact that its bloodvessels had become occluded by thrombi during the contractions of the uterus.

Total Extirpation of the Cancerous Uterus at the End of Pregnancy.

An account of an interesting operation for the radical cure of cancer of the uterus during pregnancy is given by Möller in the *Centralblatt für Gynäkologie*, 1892, No. 6. The method pursued was that of the Cæsarean section followed by total extirpation of the uterus as urged by Freund. The patient was aged thirty-five years and a multigravida. Examination revealed cancer of the cervix which had not yet extended to the tissues of the pelvis. She was admitted to the clinic at the beginning of labor. The operation consisted in abdominal section followed by raising the uterus and pulling it strongly forward behind the symphysis pubis. An elastic ligature was then put about the uterus, and the child was extracted through uterine incision. The uterus was then strongly anteflexed and pulled upward, and the tissues were carefully examined to observe how far the cancer had extended. The vagina was cut through three-quarters of an inch below the hard cancerous tissue. The finger was then passed into Douglas's cul-de-sac and the tissues sutured by a curved needle passed from within outward. By pulling the uterus strongly upward the edges were brought well together. A similar procedure was carried out upon the other side. The dissection separating the bladder from the uterus was rendered difficult by the great engorgement of the tissues with blood. The uterus was then removed. It was impossible

to perfectly close the peritoneal cavity, and hence the pelvis was tamponed with iodoform gauze which was brought out through the vagina. The patient reacted well after the operation, and the tampons were removed on the sixth day; on the seventh, a portion of the stitches were taken out; in the evening of the seventh day a loop of intestine was observed to protrude from the upper portion of the wound; after anæsthetizing the patient the intestine was carefully washed with sterilized water, replaced, and the wound freshly brought together.

Thirteen days after the operation all stitches were removed, and on the seventeenth day the patient's temperature was normal. From the seventh day the vagina was douched twice daily with sterilized water. Fragments of necrotic tissue and ligatures came away spontaneously. Four weeks after the operation the patient left her bed. She was soon attacked by influenza, from which she made a tedious recovery. When last examined the abdominal scar was firm and smooth, and no evidence that the cancer was returning could be found. The child survived.

Cæsarean Section for Cancer of the Cervix and Vagina.

Bogdanik reports in the *Centralblatt für Gynäkologie*, 1892, No. 6, the case of a multigravida, aged forty years, who had borne twelve children. The patient was at term, had had pains for twenty-four hours, the membranes had ruptured. Upon examination, carcinoma of the cervix and vagina was found, permitting the entrance of the finger-tip only into the uterus. The fœtal heart-sounds were feeble. The patient was immediately anæsthetized, the abdomen opened, and the uterus incised *in situ*, when a dirty yellow fluid escaped. The child was delivered asphyxiated, but soon revived. The uterine cavity and the field of operation were cleansed with 3 per cent. carbolic acid solution and cotton, and the uterus closed with sublimated catgut and continuous suture. Iodoform was freely sprinkled upon the parts and the peritoneum closed with continuous suture of sublimated catgut, the skin and muscle with chromic acid catgut. The wound was dressed with 30 per cent. iodoform gauze, cotton, and binder. The patient recovered speedily from the operation, union occurring by first intention without peritonitis. The mother died, however, shortly after from exhaustion produced by the cancer. The child survived and flourished.

The Porro Operation, with Intra-peritoneal Treatment of the Pedicle.

The statement recently made by Lihotzky that the Porro operation should be performed for myoma of the uterus complicating pregnancy with the intra-peritoneal treatment of the pedicle finds illustration in a case reported by Von Woerz, one of the staff of Chrobak's clinic in Vienna (*Centralblatt für Gynäkologie*, 1892, No. 5). The patient was a multipara who had suffered from pains in her bones during previous pregnancies. Several of her children had been stillborn. Her last pregnancy was characterized by the same pains, which did not diminish in intensity. The pelvis was found to be contracted, so that Cæsarean section would be required to deliver a

living child at term. She was discharged from the hospital to return at the end of pregnancy for operation.

Abdominal section was made by Chrobak at the beginning of labor. The uterus was brought forward out of the abdominal cavity, incised, and the child readily delivered. The broad ligaments were ligated, an elastic ligature applied, and the uterus amputated. The cervix was then seared with the Paquelin cautery, and the uterine arteries were tied. When the elastic ligature was removed some hemorrhage occurred, which was checked by ligating the individual vessels. The cervix was again seared, when it was found that it had so contracted that a small strip of gauze could be passed through it with great difficulty. It was found almost impossible to check slight hemorrhage from the pedicle until the peritoneum was stitched over the stump. When this was accomplished, the abdominal wound was closed as usual. The iodoform gauze was removed on the fourth day, and on the eighteenth day the patient left her bed. The pains in the bones entirely disappeared after the operation, and the patient made a perfect recovery.

The Posture of the Puerperal Patient.

Duke (*Medical Press*, 1892, No. 2753) considers the usual custom of keeping the puerperal patient upon her back for a long time after labor to be most injurious. He claims that drainage of the birth-canal is least thorough in this position, and that retro-displacements of the uterus frequently result from this custom. He favors the semi-recumbent position upon the hip or the sitting posture for a few moments after the first twenty-four hours. These positions favor involution and promote the action of the bowels. The best posture to favor the delivery of the placenta is the prone position, and the puerperal patient should assume this posture for a short time daily.

Mutiple Arthritis causing Premature Labor.

The clinical bearing of arthritis during pregnancy is considered by Tracon and Bué in the *Archives de Tocologie*, 1892, No. 1. They report two cases as follows: The first was a woman pregnant for the second time, who was subjected to sudden cold followed by pains in the lower extremities, especially in the right knee. She entered a hospital where she was observed to have fever for several days. The pains passed through the lower extremities to the upper, the left shoulder becoming especially involved. On entering the Maternity Hospital her rheumatic affection was most prominent in the thumb of the right hand, which was immovable and very painful to the touch. The right knee was also very painful and partly ankylosed. The patient had an abundant leucorrhœal discharge but otherwise revealed nothing of interest. The induction of labor was determined upon by the method of warm antiseptic douches. Soon after delivery the pains began to grow less, and finally disappeared under treatment by counter-irritation. The child suffered from pain in the left arm, which caused it to immobilize the limb.

A second case was that of a woman aged twenty-seven years. She was taken during pregnancy with inflammation of the right knee, which had been previously immobilized by a surgeon. The arthritis was considered gonor-

rhœal in origin. On admission into the hospital the knee was found considerably swollen and in a state of acute inflammation. The joint-pains continuing severe, the induction of labor was proposed and accepted by the patient. A marked improvement followed, which terminated in the patient's recovery.

PÆDIATRICS.

UNDER THE CHARGE OF

LOUIS STARR, M.D.,

OF PHILADELPHIA;

ASSISTED BY

THOMPSON S. WESTCOTT, M.D.,

OF PHILADELPHIA.

THE TONGUE IN SCARLATINA.

NEUMANN (*Deutsche med. Zeitung*, 1891, No. 63, p. 715) states that in this disease the tongue passes through three stages of change: 1. Tumefaction of the mucous membrane with disturbance of the epithelium; 2. Desquamation; 3. Regeneration of the desquamated epithelium. The appearance of the characteristic "strawberry" tongue is caused, as is well known, by the swelling of the filiform and fungiform papillæ deprived of their epithelium. Of 48 patients examined for this symptom, the "strawberry" tongue was found in 38 (79 per cent.); in 4 the tongue was in one of the three stages mentioned above; while in 6 no modification was observed. Dyspeptic troubles precursory to the disease often so modify the tongue that the mucous membrane shows no new modification under the influence of the exanthem. The "strawberry" tongue was observed to last for one day in 3 cases; two days in 5 cases; three days in 6; four days in 4; and more than four days in the other 20 cases. It appeared during the first three days in 32 per cent. of the cases, and upon the fourth day in 68 per cent. The intensity of the cutaneous eruption seemed to bear no relation to the modifications of the tongue.

LARYNGISMUS STRIDULUS CURED BY FORCED DILATATION OF THE GLOTTIS.

CONSTANTIN PAUL (*Revue mensuelle des Maladies de l'Enfance*, January, 1892) reports the case of a child, fourteen months old, who, for three successive nights, so urgently suffered from laryngismus stridulus that the question of tracheotomy was seriously discussed. As a substitute for this grave remedy, the author suggested forcible dilatation of the glottis, which could be practised with a pair of polypus forceps having a convenient curve. The operation was easily done with the dilator of Laborde, and after this no further paroxysms occurred.

Intubation and Tracheotomy.

Prescott and Goldthwait (*Boston Medical and Surgical Journal*, 1891, vol. cxxv., No. 27, p. 694) publish a summarized report of 392 cases of intubation and 139 cases of tracheotomy practised at the Boston City Hospital between December 31, 1886, and January 1, 1891. During the first year of this period intubation was done only occasionally and on picked cases, while during 1890 it was practically the only operation, tracheotomy being reserved for exceptional cases or done as a secondary operation. Of the 392 cases of intubation, 80 recovered (20.41 per cent.); 36 cases were followed by tracheotomy, of which 3 recovered; and in 21 cases, in which intubation was attempted, and where either the tube was not inserted or else the child did not breathe after insertion, tracheotomy was immediately performed, these cases being included in the list of tracheotomies. Over 10 per cent. of all the cases were moribund upon admission to the hospital. In the intubation of children, the age seemed to have a decided influence upon the chances of recovery, as has been observed in tracheotomy, the percentage of recovery increasing from 14.63 for children under three years, to 30.9 for children between six and ten years of age.

In the tracheotomy series of 139 cases, 11.5 per cent. recovered, 19 of the fatal cases, however, being moribund at the time of operation. The authors have also compared their results with the statistics collected by various English, German, French, and American writers, and find that, adding their own cases to the total number, the percentage of recoveries after intubation of 2815 cases was 32.2 per cent., while after 23,941 tracheotomies the proportion that recovered was 28.67 per cent. It is interesting to note that 37 of the successful cases of intubation were seen at least a year and a half after recovery, and all had perfect voice, and nothing that would indicate any ulceration from pressure of the tube. In two intubated cases, children of fifteen and thirteen months respectively, the tube slipped into the trachea—in the first case spontaneously, in the second during or after unsuccessful efforts at removal. Both cases succumbed after tracheotomy, although in the first case the tube was by this means discovered, and with difficulty removed.

Congenital Stenosis and Atresia of the Pulmonary Artery.

Von Etlinger (*St. Petersburger medicinische Wochenschrift*, 1891, N. F. viii., No. 32, p. 371) accepts the classification of these congenital anomalies, as given by Rauchfuss and Rokitansky, in the three following groups: 1, stenosis or atresia of the pulmonary artery, with closure of the interventricular septum; 2, stenosis or atresia, with defect of the septum; and 3, complicated stenosis or atresia of the pulmonary artery, with defect of the septum. Clinically considered, the symptoms of all three groups are very similar: 1. Cyanosis (especially in case of closure of the interventricular septum) of the skin and mucous membrane, greatly increased by crying, observed at birth or immediately after. 2. Increase of cardiac dulness to the right, as a result of hypertrophy and dilatation of the right chambers. 3. A systolic murmur along the course of the pulmonary artery (sternum and adjacent part of the second left intercostal space). Cases have been

reported, however, in which, in the presence of a stenosis of the orifice of the pulmonary artery, complicated with defect of the interventricular septum, no abnormal heart-sounds could be detected. Sometimes, beside this murmur, the normal pulmonary sounds can be heard, often quite distinctly marked. Again, the murmur may be audible over the whole chest, and even in the interscapular region posteriorly, and may be so loud as to drown the normal heart-sounds. This murmur may also be caused by a defect of the interventricular septum, with persistence of the ductus arteriosus. Other less constant symptoms are weakness and languor of voluntary movements; coldness of the body, especially the extremities, after slight exposure; and from time to time attacks of dyspnœa, attended by increase of the cyanosis, and by Cheyne-Stokes respiration, or by convulsions. These attacks may end fatally. Children with the above-described symptoms sometimes survive and even reach a comparatively advanced age, as a result of compensation of the stenosis by hypertrophy of the right chambers. In this event they suffer from dyspnœa, fainting spells, palpitation, somnolence, or epileptiform convulsions. Later on, hypertrophy of the liver and disposition to hemorrhages from the nose, gums, and respiratory organs are observed; and the child begins to show stunting in both his physical and mental growth. Rarely, however, such children may enjoy a relative healthfulness.

Subjects of congenital atresia of the pulmonary artery die very early, usually in the first days or weeks of life. In only one recorded case has the life-period lasted as long as nine months. Subjects of congenital stenosis, on the other hand, sometimes reach a more advanced age, instances of twenty, thirty, and even forty years of life being on record. Cases of original stenosis may, by repeated attacks of endocarditis of the conus or of the pulmonary orifice, be transformed into cases of atresia, with consequent increased gravity of prognosis. Such subjects, in later years, not infrequently die of pulmonary complications, like pneumonia, caseous peri-bronchitis, or miliary tuberculosis.

Diagnosis is not always easy. The finer differential diagnosis between stenosis and atresia, and whether this be simple or complicated with other anomalies of structure (defect of the ventricular septum and persistence of the ductus arteriosus), is almost impossible. Most readily may this anomaly be confounded with congenital abnormality of the tricuspid orifice (stenosis or insufficiency), or with transposition of the great vessels, which latter is attended with cyanosis, and, as a result of its not infrequent complication with other anomalies, may be accompanied by murmurs whose localization is practically impossible.

The Treatment of Empyema in Children.

Edouard Martin (*Revue Médicale de la Suisse Romande*, 1892, No. 1, p. 46) gives the clinical histories of eight cases of purulent pleurisy treated in various ways. Two cases were cured after a single aspiration; one by spontaneous opening, followed by antiseptic incision; and five by antiseptic pleurotomies. In the five pleurotomies cure was rapid, the duration of the period of recovery—*i. e.*, until the adhesion of the pleural surfaces—lasting in no case longer than six weeks. Scarcely any deformity of the chest-walls

occurred, the abscess cavity rapidly diminishing, and the lung expanding within a few days after incision. In conclusion, the author advises that in recent cases simple puncture with the aspirator of Potain should always be tried as the first operative intervention. If this mode of treatment is not sufficient—if the pus is not thoroughly evacuated by the trocar, if the general condition of the child continues to grow worse, and fever persists—then incision should not be delayed. The fifth intercostal space should be chosen for the incision, and a good-sized drain inserted, with an antiseptic dressing to be changed daily. The siphon, because of the difficulty of its application in young children, of the necessity of immobilizing the patient, and the constant watchfulness entailed upon the attendants, should be reserved for cases of chronic pleurisy. Despite the opinion of Schede, Ziemssen, and others, resection of the rib should be reserved, the author thinks, for exceptional cases.

Chronic Peritonitis in Childhood.

Henoch (*Deutsche medicinische Wochenschrift*, 1892, No. 1, p. 1) contributes a timely paper under this title. According to his researches, as early as 1838 Wolff published a study on chronic peritonitis, and stated this to be an exceedingly common affection in children, of which he had in a period of six years observed more than a hundred cases. The chief symptom described by him was a copious abdominal effusion. It is, however, very likely, from more modern observations, that a large proportion of these cases were incorrectly diagnosticated, which is the more probable from the fact that all were reported cured. From that time until the appearance of Galvagni's work, in 1869, the subject seemed to have been forgotten. Soon after this, however, the increasing activity in abdominal surgery very rapidly multiplied the number of recorded cases, while at the same time the opinion gained general credence that all such cases were of a tubercular origin. As late even as 1884, West, in his treatise on diseases of children, stated that chronic peritonitis was almost without exception tubercular. This view, however, has been considerably modified by the more recent studies of Baginsky, Vierordt, and others, and it is now accepted that the peritoneum, just as well as the pleura, may be the seat of a simple chronic inflammation with serous exudation.

This simple form, which excludes all intra-peritoneal suppurations, is characterized by a slow evolution, absence of spontaneous pain, or of tenderness to pressure: the only symptom is a free or encysted ascites. The etiology is most often very obscure; rarely a history of traumatism may be elicited. In a second group of cases a preceding exanthem may be the apparent etiological factor, as seemed to be likely in two cases—one observed by Fiedler and the other by Henoch—occurring after measles. The complete cure after several tappings, in the author's case, left no doubt of the true character of the disease. The point of greatest value in diagnosis is the general state of the patient. In the simple form, the general nutrition and well-being of the child suffers but little; while, on the contrary, in the tubercular variety, the emaciation is striking. Search for bacilli in the effusion, even in tubercular cases, is often disappointing, and therefore a negative finding does not exclude the more serious disease.

Most of the patients are females—a fact that suggests a possible connection in many cases between the peritoneal inflammation and a vulvo-vaginitis, which is by no means uncommon in little girls. In the differential diagnosis one must consider the possibility of cirrhosis of the liver, which in both the hypertrophic and the atrophic form is not unknown in the child. Autopsies upon cases of tubercular peritonitis quite often show an accompanying interstitial hepatitis, probably explainable by a direct extension of the inflammation along Glisson's capsule to the parenchyma of the organ. On the other hand, the peritoneal inflammation might be secondary to the hepatic disease.

In the way of treatment, internal medication has no appreciable effect. Simple puncture is more successful, and, moreover, a cure may spontaneously take place. Surgeons have profited from these facts to attribute cures of tubercular peritonitis to laparotomy. König has reported 130 successful cases (7 in children between seven and ten years of age), and Alexandroff, 20 cases between two and fifteen years—all said to be tubercular. The author regards these cases with considerable doubt, for the good reason that none of them have been followed long enough, and because he believes that many false diagnoses have been made, cases of the simple peritonitis above described having been mistaken for the tubercular variety. He details a case that came under his care, which was submitted to laparotomy as a tubercular case. The peritoneum was found studded with small nodosities; but microscopic examination proved them to be of purely fibrous structure, and no tubercles, bacilli, or giant-cells were found. The child was cured, and still continues in good health. He therefore believes that many like cases have been set down in the category of tubercular peritonitis cured by laparotomy.

The Subcutaneous Injection of Salt Solution in the Gastro-enteritis of Infants.

Demiéville (*Revue Médicale de la Suisse Romande*, 1892, No. 1, p. 54) records a case of grave gastro-enteritis in an infant of four and a half months, in which, as a last resort when the child was in collapse, he practised the injection of four or five ounces of a solution of sodium chloride beneath the skin of the thighs. The success of this treatment was striking: no further vomiting or diarrhœa occurred, and the case pursued a rapid course to complete recovery. The mode of action of the injected fluid is capable of various explanations.

Whatever may be considered the essential cause of death in these cases, the sudden introduction of a considerable quantity of fluid into the organism either must act mechanically upon the walls of the vessels and improve the general circulation, or must directly stimulate the cardiac nerves. In either case, the central nervous system receives a more or less powerful impulse which enables it to overcome the depressing influences of disease, and to stimulate the glandular organs to reassume their functions.

The technique of the operation is exceedingly simple, and needs no complicated appliances. An irrigator or any extemporaneous substitute, to which a new rubber tube may be attached, will do admirably. All the parts must be sterilized by boiling or by a careful lavage with sublimate solution (1 per cent.), and subsequent rinsing with boiled water. The Dieulafoy needle or a

trocar like Potain's completes the apparatus. A litre of a 6 per cent. sterilized salt solution is prepared, somewhat warmer than required, in order to make up for loss of heat while passing through the apparatus (say 42° to 45° C.), and the injection is made slowly under a pressure gained by an elevation of four to five feet.

The author believes that subcutaneous injections of salt solution will be found of inestimable value in many cases of extreme depression in the acute diseases of children, where the organism only needs to be tided over a few days until its own reparative forces can again assert their supremacy. In the exhaustion attendant upon severe diphtheria, he thinks that life might often be saved by recourse to this method of treatment.

THE TEMPERATURE IN ACUTE PRIMARY PNEUMONIA OF CHILDREN.

As the result of a study of this subject, HOLT (*Archives of Pædiatrics*, 1891, No. 12) makes the following summary:

1. The predominating type of temperature in acute primary broncho-pneumonia is high and remittent, the daily fluctuations amounting usually to from three to five degrees Fahr. The sustained high temperature is uncommon except in the rapidly fatal cases. A low range of temperature—only two or three degrees above the normal—is not very uncommon, but is more frequent in fatal cases.

2. The termination of the fever is almost invariably by lysis.

3. The lowest mortality is among cases in which the fever lasts from eight to fourteen days; the highest is among those lasting but two or three days; and next to these the protracted cases, lasting over four weeks.

4. The day of highest temperature in fatal cases is usually the last day; in recovery cases there is no rule in this respect.

5. The lowest mortality is seen in the cases in which the highest point reached was between 103° and 104.5° F. Above 105° the mortality rises with the increase of each degree in the temperature. Abnormally low temperatures are also to be dreaded, since they usually indicate a constitutional condition which makes recovery very doubtful.

Note to Contributors.—All contributions intended for insertion in the Original Department of this Journal are only received *with the distinct understanding that they are contributed exclusively to this Journal.*

Contributions from the Continent of Europe and written in the French, German or Italian language, if on examination they are found desirable for this Journal, will be translated at its expense.

Liberal compensation is made for articles used. A limited number of reprints in pamphlet form, if desired, will be furnished to authors in lieu of compensation, *provided the request for them be written on the manuscript.*

All communications should be addressed to

DR. EDWARD P. DAVIS,

250 South 21st Street, Philadelphia